Checking Traction Gear Wear

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Articulated Piggyback Cars

...page 35

RAILWAY

LOCOMOTIVES AND CARS

A SIMMONS-BOARDMAN **TIME-SAVER** PUBLICATION

JANUARY 1960

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EDITORIAL DEPT
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Great Northern Mechanizes Car Cleaning...page 17

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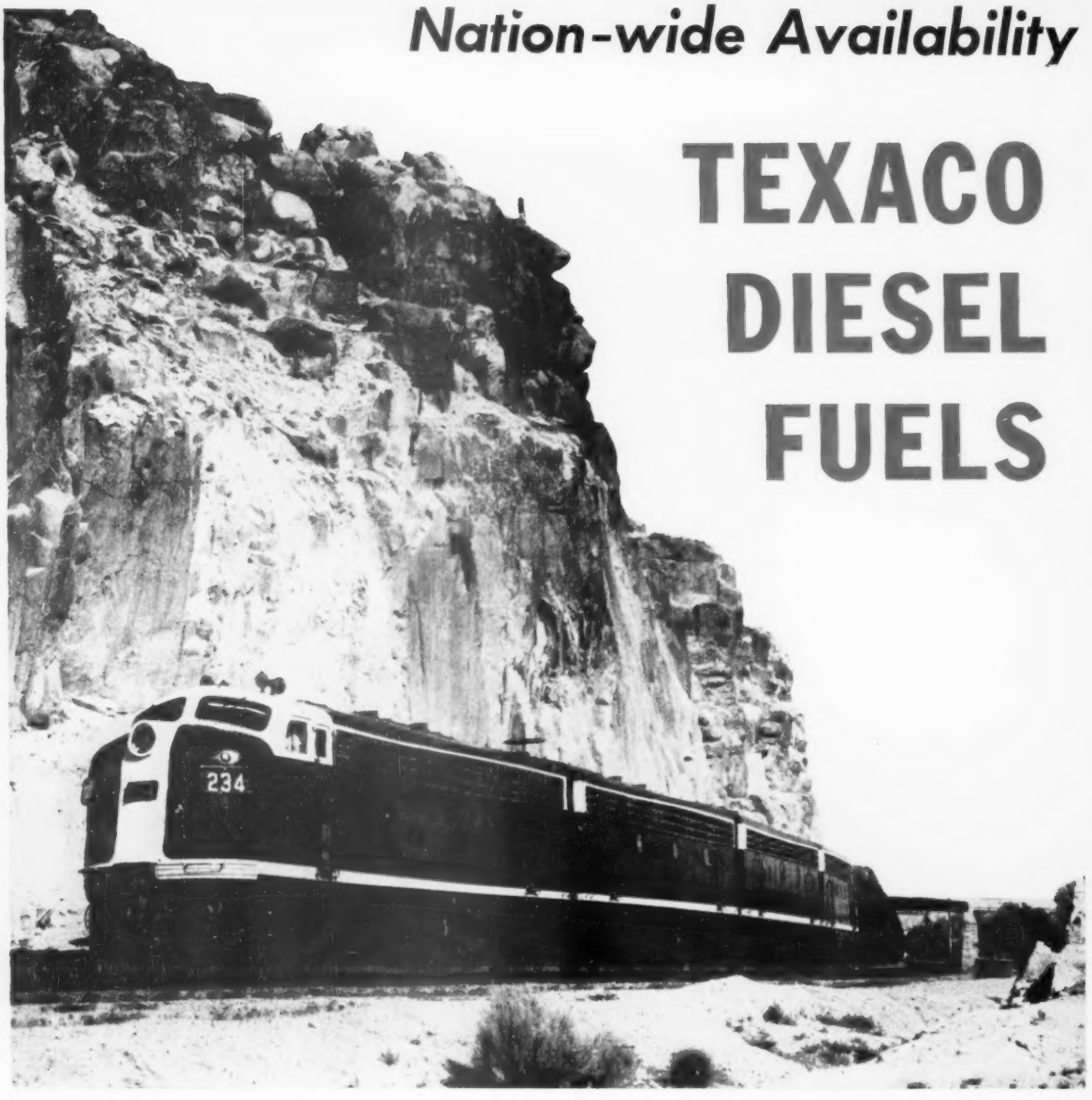

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RAILWAY
LOCO-MOTIVES AND CARS

The Oldest Trade Paper In the United States

January 1960—Vol. 134, No. 1

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REPORT FOR JANUARY

AAR Task Force Sought for Hotboxes

Progress toward reducing the number of hotboxes has been disappointing, according to Ward N. Messimer, retired manager - equipment, Merchants Despatch Transportation and Northern Refrigerator Line. Experience in similar research and development situations, such as the successful development of the AAR standard coupler and present standard air brake and, more recently, successful simplification of interchange rules, has proved the worth of the task force approach. Initially, a task force should have been handed the hotbox problem.

Mr. Messimer, however, doesn't think it's too late to try to whip the problem; a task force "composed of men competent and experienced in lubrication, car maintenance and operation could [still] be engaged to work out a comprehensive program that will produce the results for which railroads have been hopefully in search." Such a task force approach, Mr. Messimer suggests, could be made under the guidance of the AAR Mechanical Division's Arbitration Committee, a group he formerly headed.

The Committee, he says, "is vitally concerned in any proposition where the administration and enforcement . . . is accomplished through the Interchange Rules and generally takes no action in connection with such matters without thorough investigation and consideration. However, in response to a directive, the provisions requiring the application of lubricating devices . . . were authorized to be incorporated in the rules . . . with practically no opportunity to investigate the proposition."

Mr. Messimer, speaking before a meeting of the Car Department Association of St. Louis, also had these views:

- A more positive method is needed to control truck maintenance. One road, he said, has been pressing for stricter requirements for condemnation and renewal of certain critical truck parts "and I believe this movement is worthy of our active support. It's especially important that appropriate action be taken to insure that the correct size of controlled clearance bearings is applied in all cases."

- The requirement that all cars must be equipped with lubricating devices by Jan. 1, 1961, sets "an impossible target date" which will probably be extended for practical and economic reasons. As it stands, however, "the fact that so little time is allowed to equip more than 1,000,000 cars [means] devices with questionable records are likely to be applied to cars with unfit truck conditions."

- Specifications for lubricator acceptability should be tightened. Under present specs, Mr. Messimer points out, a lubricator suitable for approval shall experience no more than 105 hotbox set-outs per 54,000 car-months of active service. Unconfirmed reports indicate that the device with the best record showed a set-out rate well below 105. Mr. Messimer contends that the industry can afford only the best and "devices of any less effective value should not be considered for full or conditional approval."

Safety Appliances For Covered Gondolas

The AAR Mechanical Division has clarified interpretation of Safety Appliance conditions on gondolas which have removable roofs for lading protection. Requirements specify the top side and end handholds at the ladder corner be not more than 4-in. below the top of car. When the roof is applied, regulations require the ladders to conform to those specified for box or other

(Continued on page 7)

TIME SAVING IDEAS FOR JANUARY

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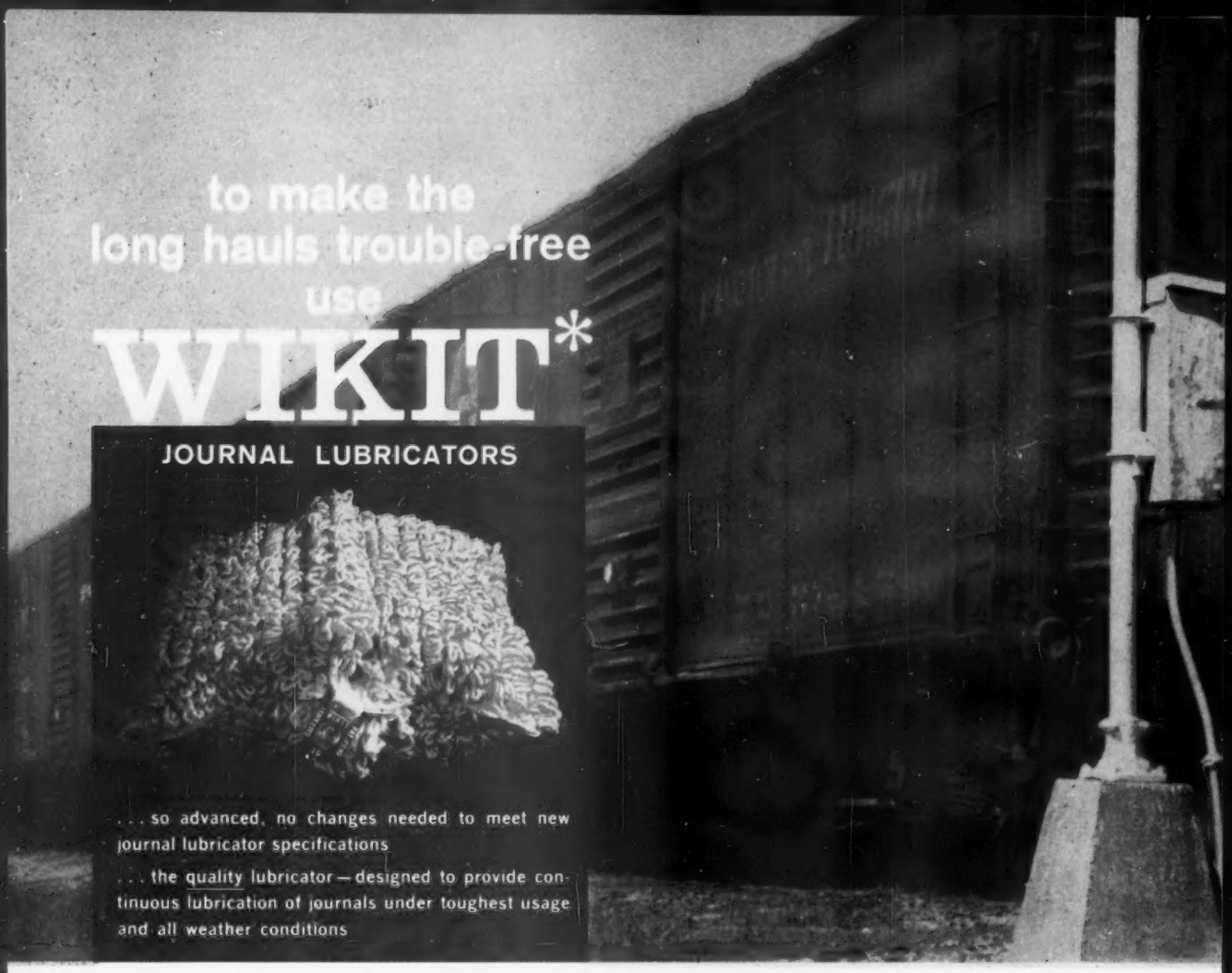
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. . . so advanced, no changes needed to meet new journal lubricator specifications
. . . the quality lubricator—designed to provide continuous lubrication of journals under toughest usage and all weather conditions

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house cars. To meet both these conditions the roof, when applied, will cover the top side and end handholds of the gondola car. When this is done, Safety Appliance requirements for box car ladders can be met without any violation. This permits handholds required for a gondola car to be available for use in loading and unloading when the end section of the roof is removed, or when the car is loaded as an open-top gondola.

NITX Established As Car Lease Pool

North American Car Corp. has set up a new division to provide a pool of specialized cars for lease to railroads.

Initial lease operations cover 300 85-ft piggyback flat cars of various designs. Among the roads scheduled to join the pool: Rock Island, Southern Pacific, Rio Grande and Minneapolis & St. Louis. Another half dozen roads are interested, including one Trailer Train member which may join the pool while remaining in TTX.

Seventy-five covered hopper cars have also been made available to the pool and other types of specialized equipment will be added at the request of member railroads.

Gen. E. C. R. Lasher, North American president, said the new division will be known as the North American Integrated Transportation Division. Equipment will carry NITX reporting marks.

Member roads take a term lease — 15 years—on a set number of cars for which they pay a per diem rental of about $6.30. In addition, to provide for seasonal or geographical variations in loadings, NITX will provide each member line with up to 10% of the number of cars it has leased on a "when-needed" basis.

Maintenance of the cars will be handled by the railroads during the term of the original lease. North American will take over maintenance on leases which are extended.

Administration and operation of the pool, General Lasher said, "will be on an impartial basis and not geared to favor one member over another."

Earlier this year, North American and Emery Transportation Corp. set up a new company to provide flat cars and mechanically refrigerated trailers for shippers.

In the railroad field, only other TOFC pool is the fleet owned by Trailer Train Co., with a membership of 18 railroads and a freight forwarder. Three manufacturers—General American and Pullman-Standard (through Transport Leasing Co., subsidiary of Pullman Inc.) and Strick—have also set up the machinery for equipment leasing.

AIEE Meeting February 1-2

The Land Transportation Committee of the American Institute of Electrical Engineers will hold its Winter General Meeting at the Hotel Statler, New York, Monday, February 1, and Tuesday, February 2. Technical sessions will be held as follows.

Monday, February 1
9 a.m.

Train Performance Calculations — Supplementary 650 program, J. E. Hogan, Pennsylvania

A Digital Computer Simulation of Single-Track Railroad Operation, R. T. Coupal, L. L. Garver, and W. R. Smith, General Railway Signal Co.

Semi-Conductor Locomotive Excitation Control Developments, T. T. Means and W. B. Zelina, General Electric Co.

Tuesday, February 2
9 a.m.

GG-1 No. 4800—25-Year History, J. W. Horine, electrical engineer, Pennsylvania, and H. S. Ogden, General Electric Co.

Experiences of the Sorocabana Railway with Electrification, 1943-1958, Dr. E. Dutra de Toledo

Economic Trends Make Railroad Electrification Inevitable, L. B. Curtis, assistant engineer, Pennsylvania.

Virginian Locomotive Maintenance Costs, T. F. Perkinson, General Electric Co.

2 p.m.

High Performance Rapid Transit Cars for the Hudson & Manhattan, S. V. Smith, assistant electrical engineer, Pennsylvania; W. C. Wheeler, St. Louis Car Co., and W. H. Wood, General Electric Co.

New Passenger Car Equipment of the Chicago & North Western, J. L. Swarner, Pullman-Standard Div.

Loading of Transportation Rectifier Substations, L. De Koranyi, General Electric Co.

(Turn to page 47)

Orders and Inquiries for New Equipment

Placed Since the Closing of the December Issue

Diesel-Electric Locomotive Orders

Road and builder	*No. of Units*	*Horsepower and type*	*Detail*
LAKE SUPERIOR & ISHPEMING:			
Alco Products	1	1,800 road switcher	
SANTA FE:			
Alco Products	25	2,400 road switcher	Low-profile, DL-600's, powered by 251 turbosupercharged engine.
Electro-Motive	35	2,400 Road switcher	SD-24's. Cost of 60 locomotives approx. $15,600,000. Deliveries scheduled for first half 1960.

Freight-Car Orders

Road and builder	*No. of cars*	*Type of car*	*Detail*
BALTIMORE & OHIO:			
Company shops	2,000	Hopper	
	500	Gondola	
	500	Box	
CANADIAN PACIFIC:			
National Steel Car	500	Box	Insulated, 50-ton.
ILLINOIS CENTRAL:			
Company shops	1,500	Hopper	70-ton
	500	Box	50-ton
	100	Flat	Bulkhead type
LOUISVILLE & NASHVILLE:			
American Car & Fdry.	150	Box	DF
	100	Box	50-ton.
	42	Covered hoppers	70-ton.
Pullman-Standard	1,700	Hoppers	70-ton.
	900	Gondolas	70-ton.
	108	Covered hoppers	70-ton.
MILWAUKEE:			
Strick Trailer *	25	Flat	85-ft. For spring delivery.
MONON:			
Pullman-Standard	30	Covered hopper	70-ton, 3,215-cu ft cap. Cost, approx. $346,000. For delivery first half 1960, depending on steel availability.
NORTHERN PACIFIC:			
Pacific Car & Fdry.	100	Mech. refrigerator	70-ton. Cost, approx. $2,675,000. For late second quarter delivery.
READING:			
United States Ry. Equip. Co. *	466	Hopper	50-ton.
TRAILER TRAIN:			
Bethlehem Steel	200	Piggyback flat	Total of 500 cars to be 85 ft and equipped with roller bearings, ride control trucks, and rubber cushion draft gear. Cost, over $7,500,000. For spring completion.
Pullman-Standard	300	Piggyback flat	
UNION PACIFIC:			
General American	25	Piggyback flat	85-ft. For four-road auto TOFC pool operating on Pacific Coast.

*Lessor

Notes and Inquiries

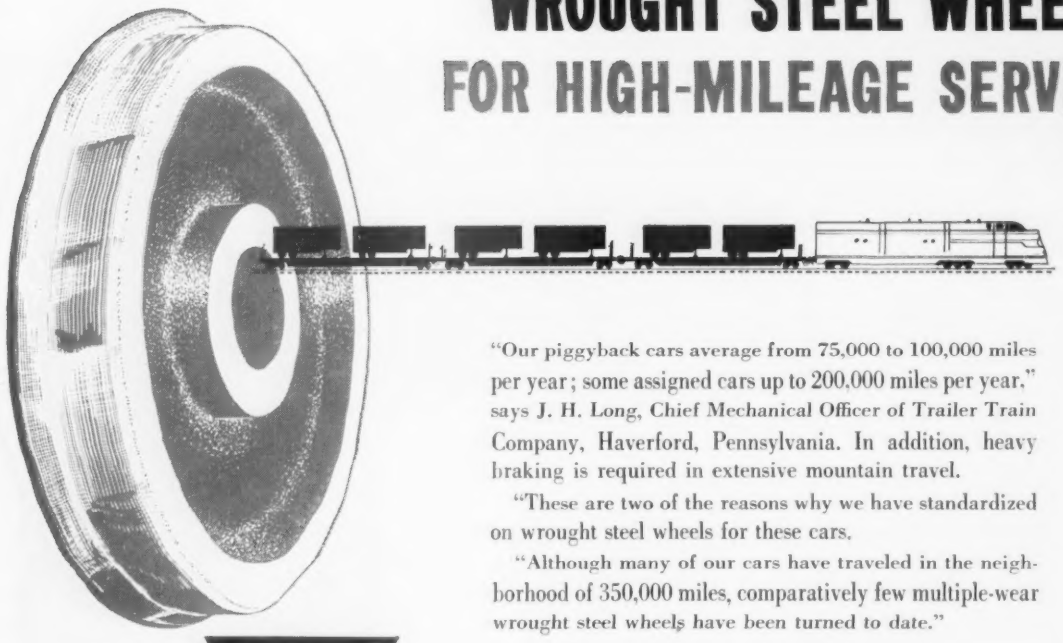
Illinois Central. Acquisition of 2,495 new freight cars will constitute major part of a $26,800,000 equipment program for 1960. Included are the 1,500 hopper, 500 box, and 100 flat cars listed above to be built in company shops; 200 70-ton gondolas, 150 covered twin hopper cars, 20 covered triple hopper cars, 25 piggyback flat cars to be acquired from outside car builders; and 15 GP-9 road switchers.

Missouri Pacific will equip 23,921 freight cars with journal lubricating devices at a cost of $1,234,100. Expenditure part of road's equipment modernization program for 1960.

Pennsylvania. During December the last three of an order for 50 1,750-hp general purpose diesel-electric locomotive were received and placed in service. Plans for the acquisition of these locomotives were announced in the June issue of RL&C, p 7.

Santa Fe has completed an experimental double-deck flat car for handling automobiles. Car has 18-in. Shock Control sliding center sill. The 1,7500 Santa Fe Shock Control box cars now in service have 10-in. sliding center sills.

TRAILER TRAIN SPECIFIES WROUGHT STEEL WHEELS FOR HIGH-MILEAGE SERVICE



"Our piggyback cars average from 75,000 to 100,000 miles per year; some assigned cars up to 200,000 miles per year." says J. H. Long, Chief Mechanical Officer of Trailer Train Company, Haverford, Pennsylvania. In addition, heavy braking is required in extensive mountain travel.

"These are two of the reasons why we have standardized on wrought steel wheels for these cars.

"Although many of our cars have traveled in the neighborhood of 350,000 miles, comparatively few multiple-wear wrought steel wheels have been turned to date."

New steels are born at Armco

Forging and rolling make the difference

After more miles, there's more metal left on wrought steel wheels. Forging and rolling refine the structure of the steel—give it greater resistance to wear, shock and pounding. That's why you get more service miles per dollar, greater safety, with Armco Wrought Steel Wheels.

For price and delivery information, just call your Armco Sales Office or write Armco Steel Corporation, 3329 Curtis Street, Middletown, Ohio.

This is typical of the high-mileage Trailer Train piggyback cars, many of which have Armco Wrought Steel Wheels. All cars are 70-ton capacity, and range in length from 75 to 85 feet.

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

AAR CONDITIONALLY APPROVED

HENNESSY LUBE-PAD-13

The Hennessy Lube-Pad-13, now AAR conditionally approved effectively meets the need for a dependable, long life, high quality pad that will constantly provide top lubrication.

Designed to follow the contour of the box, Lube-Pad-13's soft pliable construction affords maximum contact with minimum pressure against the journal. Multiple fold design provides voluminous oil to the journal at all times under all conditions. Neoprene foam core retains from four to five pints of oil in addition to the free oil in the box. Short pile cabled yarn, specially twisted, resists adherence to the journal even in cold weather . . . this feature virtually eliminates pad shifting in the box.

The Hennessy Lube-Pad-13's practical design and rugged construction of heavy duty materials provides exceptionally long pad life retaining original qualities even after several renovations.

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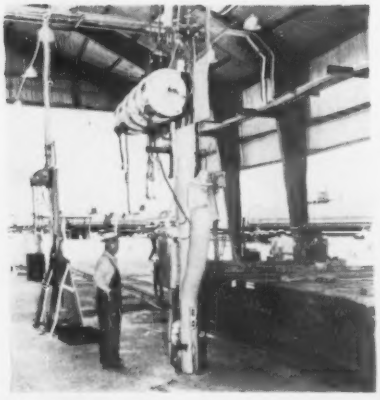


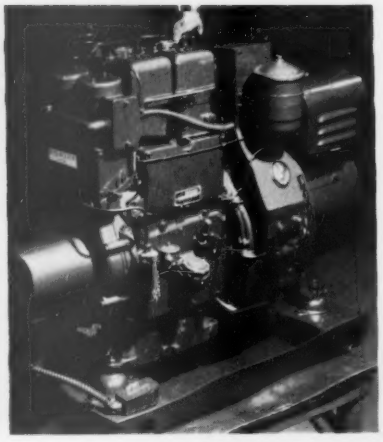
Hose and Cable Reels

Weldreels keep gas-welding hoses and electric welding cables off shop floors when not in use, out of the way of truck wheels, falling objects and sparks, and save time by having welding torch or electrode holder ready for action. Pulling out the needed length of hose or cable winds the retracting spring; pawls in the mechanism lock every 180 deg. and, when welding stops, a slight tug releases and automatically coils the hose or cable. Hose reel capacities range from 50 ft of 3/16 in. twin hose to 150 ft of ¼-in. dual hose. Cable capacities are from 50 to 150 ft of 2/0 cable. Mounts of all reels are adaptable for floor, wall, or ceiling mounting or mobile installation. *United Specialties, Inc., Dept. RLC, El Dorado, Ark.*

Ultrasonic Flaw Detection

The UM Reflectoscope provides maximum flexibility in flaw detection through interchangeable plug-in units. It features a building-block method that permits selection of only the necessary components for a testing job and provides a means for adding to instrumentation to meet increasing or changing testing requirements.

The Reflectoscope is approximately 7½ in. high, 20 in. wide, and 20 in. deep, and weighs about 35 lb. It contains three major components: (1) the display unit with a 5-in. cathode ray tube, display controls and instrument power supply; (2) pulser/receiver unit, and (3) time control unit. A handle, which permits portability, can be folded under to tilt the instrument in testing position for easy viewing. The cathode ray tube with full screen bezel is edge lighted. The time control and pulser/receiver are plug in units with a quick disconnect method for interchange or servicing. *Sperry Products, Inc., Dept. RLC, Danbury, Conn.*



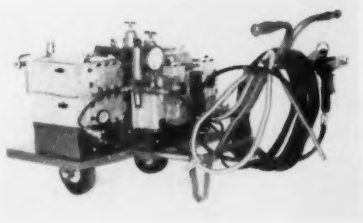
Diesel-Electric Plant

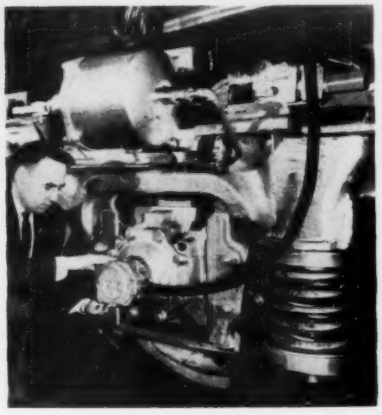
Kohler air-cooled diesel electric plants are available in 2,000, 5,000, and 7,500-watt sizes. They are said to offer fuel economy; low upkeep; quick, all-weather starting; interchangeability of all parts, except the crankshaft, and a manually operated compression release on push button and manual starting models with a solenoid operated compression release on the remote starting models. *Kohler Co., Dept. RLC, Kohler, Wis.*

Airless Spray System

The Nordson Airless spray coating equipment combines heat and hydraulic pressure instead of compressed air for atomized application of coating materials, including heavier rubber base, plastisols and catalyzed resins. Lacquer films of 1.5 mils dry and enamel films of 2.0 mils dry are obtainable with one coat. Film thickness is easily controlled and need for thinner is reduced. Because no air is used, overspray from air turbulence is largely eliminated. Solvent fumes are said to be no problem when equipment is painted in large areas and, in production spraying, a dry booth with 60 fpm face velocity is adequate.

The basic AP-15000 unit, which can be dolly-mounted, consists of a constant pressure, non-pulsating AP pump, HA-2-4000 paint heaters, PF-300 filter, circulating valve, teflon or nylon hose and the T-300 airless spray gun. The 4-wheel mounted AP-16000 unit has a motor driven compressor to supply air to the pump. The packless design T-300 gun has a carbide needle and seat and swivel fluid line connections. The heater is equipped with thermostat, indicator light, safety fuse and off-on switch, and is tested up to 5,000 psi. *Nordson Corp., subsidiary U. S. Automatic Corp., Dept. RLC, Amherst, Ohio.*



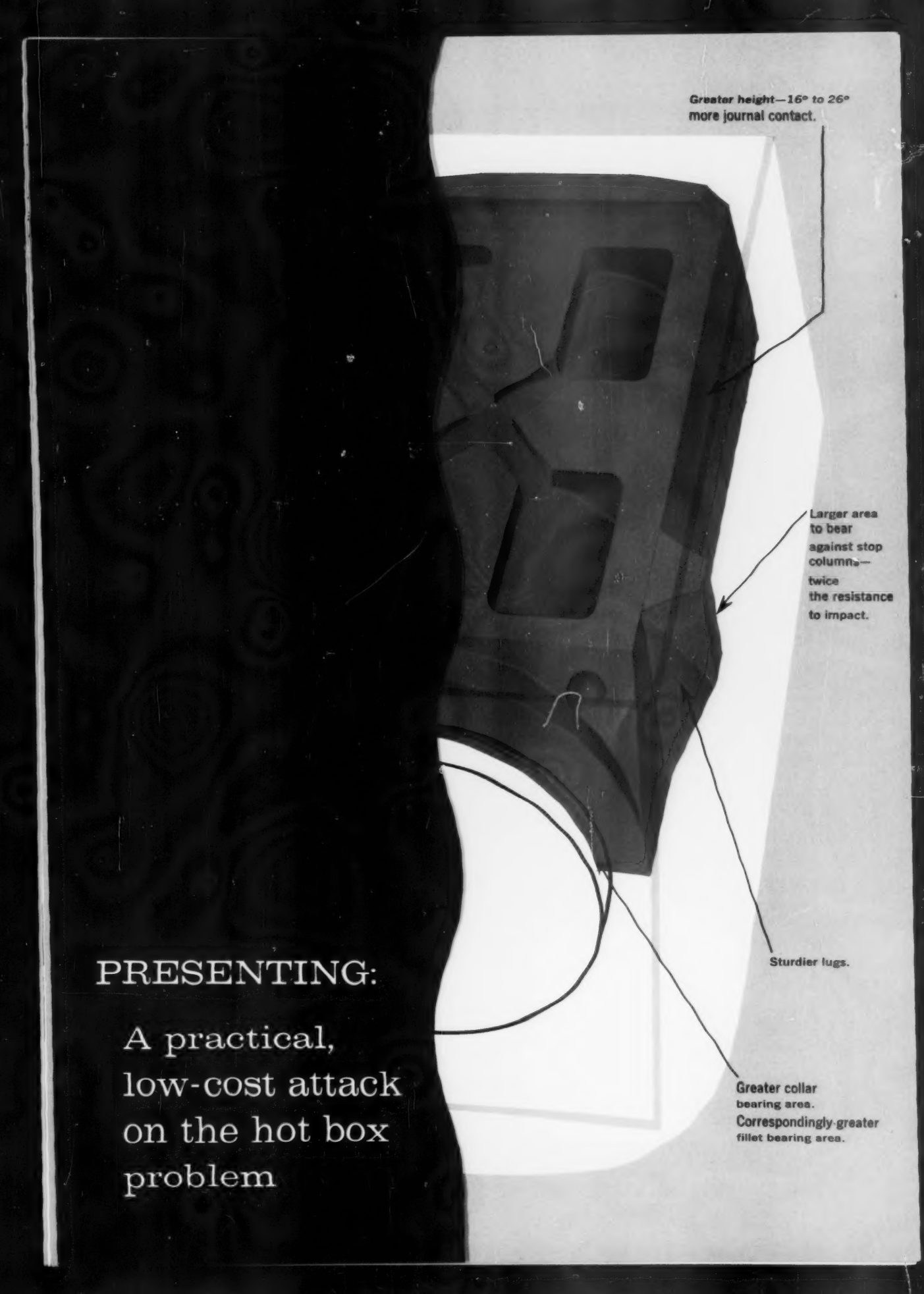


Adhesion Loss Detector

An adhesion loss detector that determines differentials in wheel speeds over the entire speed range of a diesel-electric locomotive has been tested in the laboratory and on locomotives of main-line railroads. The system, which gives a warning so that corrective action can be applied before damage occurs, consists of an axle-driven alternator mounted on one of the journal boxes of each locomotive axle; a control panel containing a frequency-to-voltage transducer; a voltage comparison circuit; a voltage comparison output detector, and a wheel-slip relay.

Axle speed signals are transmitted from the alternators to a single panel in the locomotive cab. Differences are constantly being compared and, when the predeter-

(Continued on page 46)



PRESENTING:

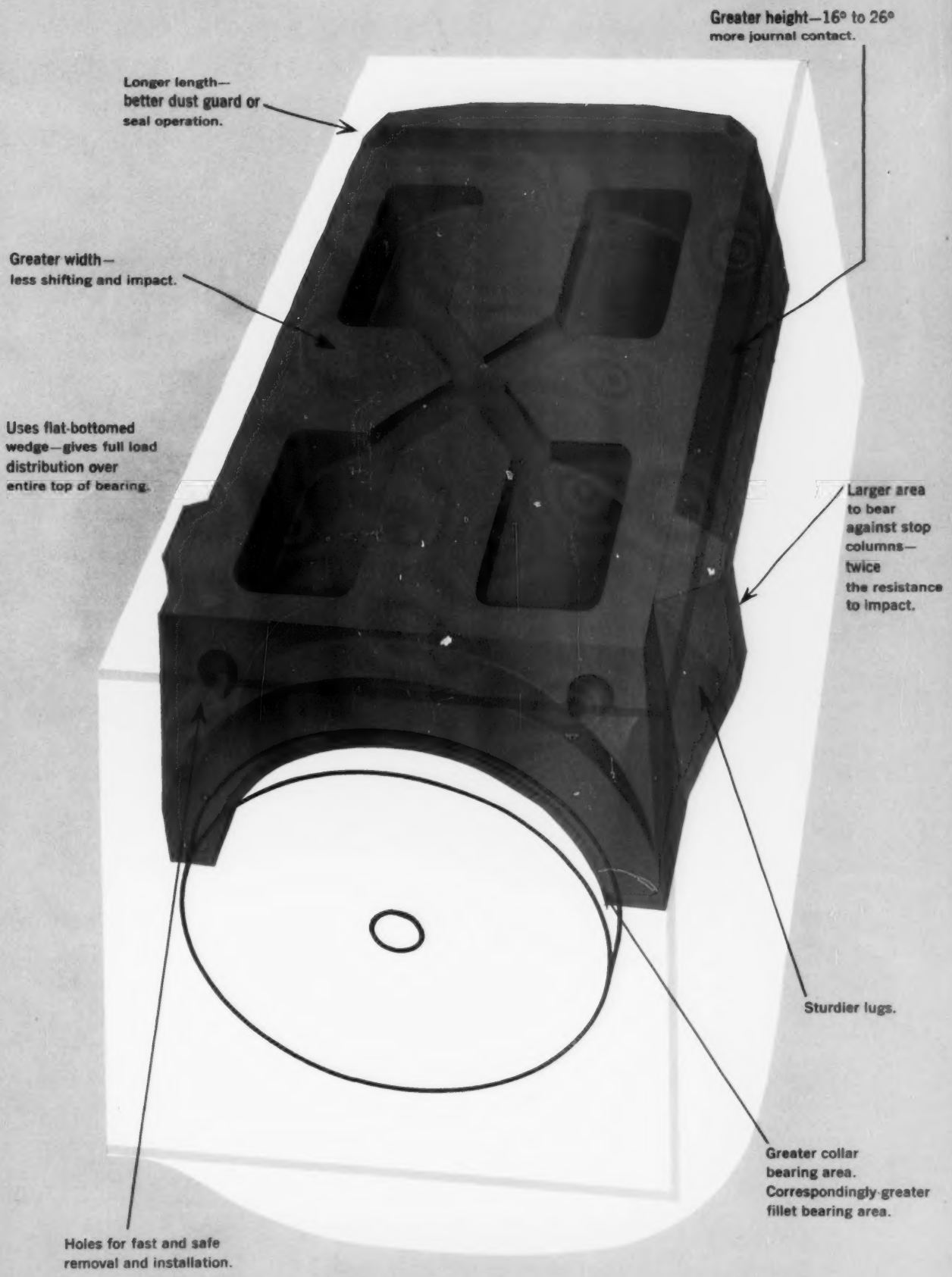
A practical, low-cost attack on the hot box problem

The ABSCO Positive Control Flat Back Bearing

Interchangeable with the standard steeple back bearing, using a simple flat back wedge.

A.A.R. APPROVED FOR

LIMITED INTERCHANGE SERVICE


Greater height—16° to 26°
more journal contact.
Longer length—
better dust guard or
seal operation.
Greater width—
less shifting and impact.
Uses flat-bottomed
wedge—gives full load
distribution over
entire top of bearing.
Larger area
to bear
against stop
columns—
twice
the resistance
to impact.
Sturdier lugs.
Greater collar
bearing area.
Correspondingly greater
fillet bearing area.
Holes for fast and safe
removal and installation.

THE ABSCO POSITIVE CONTROL FLAT BACK BEARING...

A practical low-cost attack on the hot box problem

Now you can improve the performance of the standard journal bearing assembly without the expense of modification or the addition of complicated accessories! The Absco *Positive Control* flat back bearing has been developed expressly for this purpose. Here are its principal advantages over the standard steeple back bearing:

Resists displacement of both bearing and axle.

Protects dust guard—helps it keep oil in, dirt out.

Gives your lubricator greatly improved conditions for performing its job.

Reduces impact forces due to reduction of side clearances in the box.

Provides over twice the contact area with the stop column.

Resists tilting of the bearing under impact.

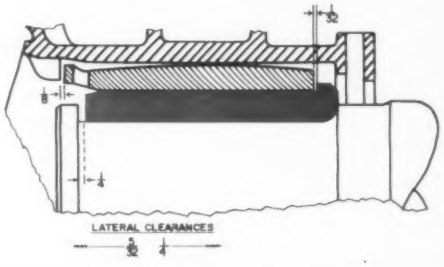
Reduces oil consumption through improved performance of the dust guard or seal.

Reduces spread linings, and substantially reduces the hazard of having strands of lubricator material trapped between journal and bearing.

Your Brake Shoe representative will be glad to review with you the impressive record this bearing has made in freight service. American Brake Shoe Company, Railroad Products Division, 530 Fifth Avenue, New York 36, N. Y.

How It Makes Possible Improved Performance of the Dust Guard

Only 13/32 in. lateral movement is permitted, compared with one full inch for the standard steeple back bearing. This restricted movement keeps the axle dust guard seat from withdrawing from the dust guard opening and damaging it upon return. As a result, effective dust guard life is substantially increased.



AMERICAN Brake Shoe COMPANY

Quality products cut your ton-mile costs

EDITORIALS

Ready for Reefers?

What are the requirements for servicing and maintaining mechanical refrigerator cars? The answer to this question is of more than academic interest in view of the fast-growing car fleet with mechanical refrigeration systems. There are about 5,000 of these cars in service or on order—about triple the number on the rails three years ago.

The situation is similar to the one facing the railroads after the last war when dieselization was at the beginning of its phenomenal growth. After years of trial and error, diesel facilities became pretty much standardized. And no small part of the job was training the personnel in the fundamentals of internal combustion engines and electrical equipment.

With only about five per cent of the refrigerator car fleet equipped with mechanical refrigeration systems, it is an opportune time for railroads and car operators to study the situation and recommend a program. It should be one flexible enough to meet the requirements of an expanding car fleet.

Prevent – Don't Pay

Prompt payment of claims for freight damaged in transit is not a sales gimmick that will attract much traffic in this decade. Shippers will not be looking for the transportation agency which pays its claims most rapidly, but for the agency which moves freight so no damage claims will be involved. For railroads, refinement of accounting procedures to speed settlements for damaged freight will be of far less importance than refinement of the impact cushioning arrangements for their freight cars.

At the recent annual ASME meeting, R. E. Abbott of the AAR and H. K. Lanning of the Santa Fe outlined the probable future of impact protection for freight cars and their ladings:

- High-capacity draft gears for cars designed to handle bulk-type commodities;
- Long-travel draft gears for cars which require moderate protection for rugged ladings;
- Sliding sills with suitable cushioning devices for protection of fragile ladings.

Provision of better impact protection on cars which are to be built must be combined with an assurance that draft gears on existing cars give maximum possible protection. Certification of gears and their reconditioning according to specification can assure some protection.

Much remains to be done. It was emphasized at the ASME meeting that there is little correlation between performance of draft gears in the conventional laboratory certification tests and the performance they will give under actual impact conditions. Suppliers and the AAR Research Center have done a great deal toward outlining the problem. A cooperative effort could probably come up with a method of draft-gear rating which will be less expensive than full-scale impact tests and more representative of the results which will be obtained when gears are actually in service.

The present car fleet is of primary importance in keying railroad freight service for the coming decade. Improvements in components for these cars must receive attention while plans and designs are made for future equipment.

Another Stone

Severe damage to traction-motor insulation may be caused by vibration. The degree of damage is apparently proportional to the square of the amplitude of vibration. Such a formula is indicated by the findings of a study which is abstracted on page 24 of this issue. This study shows that when gears are out of contour .005 in., there is little vibration, but that it will rise to a damaging value when the deviation from correct contour reaches 0.15 in.

This provides a quantitative answer to a problem which has been little understood, and it suggests another which needs a solution. A typical case is that of the railroad which assembled gears and pinions with distances between centers which were too great. The locomotives were then allowed to operate until the tips of the pinion teeth were steps in the faces of the gear teeth. At overhaul time, motor support bearings were restored to correct gear-pinion center distances and new pinions applied.

The result was not what was expected. Pinion teeth going over the steps set up vibration that shattered insulation and even broke the copper bars of the armature windings.

The new problem created by this sort of thing is who blames who for what. The gears are normally the responsibility of the mechanical department, while the electrical shop looks after the armatures with the pinions. The trouble is exactly on the border line, and each department is glad to pass responsibility to the other. Also, the cause of such trouble could be unbalanced armatures, shaft misalignment, core loose on shaft, etc. The situation is one which calls either for close cooperation and understanding, or for an arbiter to decide what needs to be done. Either course may be effective and, now that the results of vibration have been determined and evaluated, it will be much easier to reduce damage from this cause. Another stone has been turned on the path to the million-mile motor.

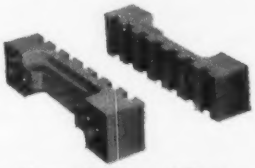
Why you can look to MAGNUS for top bearing performance

...now, and in the years to come!

Magnus bearing products have been serving America's railroads for the past century. And in full cooperation with the railroads, Magnus has pioneered many significant advances in bearing metallurgy and design. A recent example: the Magnus R-S Journal Stops. By taking the "slop" out of the journal box, R-S Journal Stops eliminate excessive bearing displacement under the severe shocks of braking and switching impacts—increasing bearing life 200% and cutting costs all along the line. Magnus lubricators provide another link in the chain of improved bearing performance. And in diesel and electric locomotives and MU cars, modern Magnus traction motor support bearings assure trouble-free mileage between motor overhauls.

With this background of experience, Magnus is continually investigating new designs of journal box components for still greater efficiency and economy in railroad service. Whatever the future may hold, of this you can be sure. Tomorrow's rolling stock will ride on Magnus bearings—bearings that are right for railroads, in performance and in cost. For further information on Magnus bearing products, write to Magnus Metal Corporation, 111 Broadway, New York 6, or 80 E. Jackson Blvd., Chicago 4, Ill.

Magnus Solid Journal Bearings



Magnus R-S Journal Stops

Magnus Traction-Motor Support Bearings

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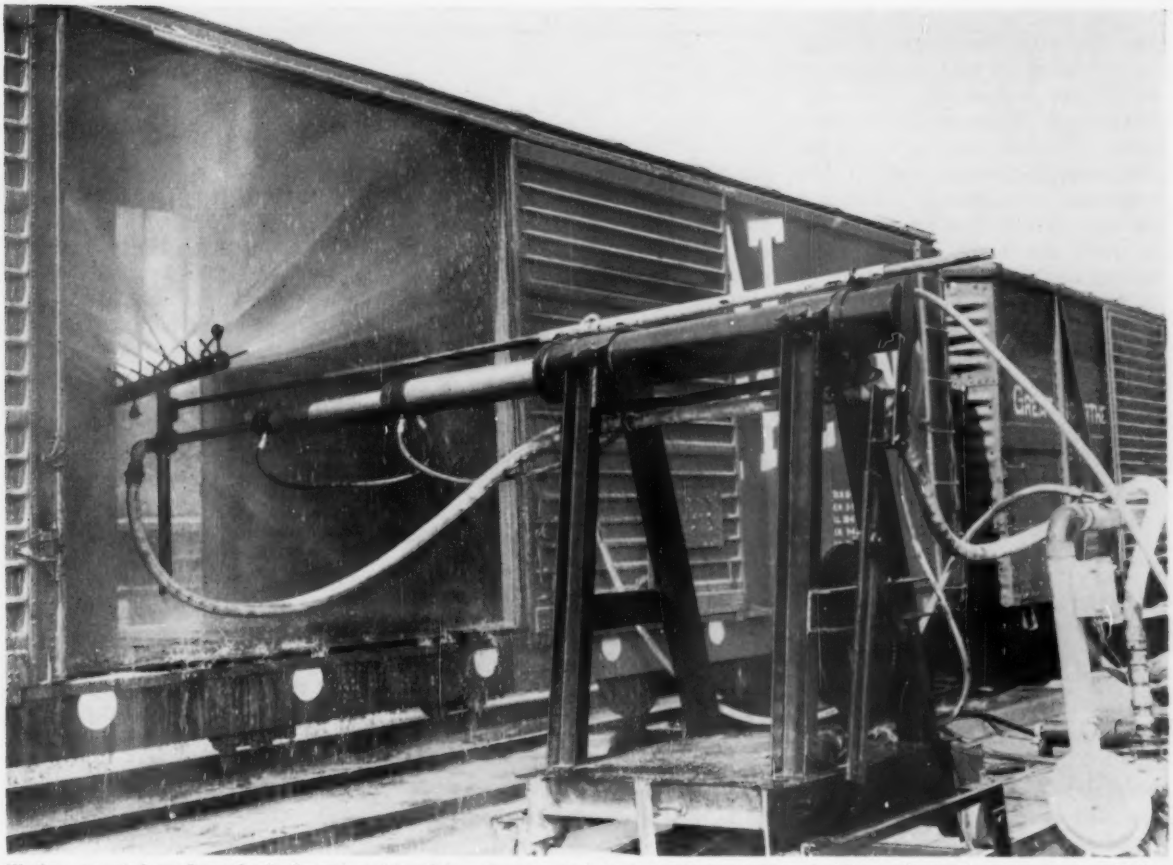


Washer, mounted on flanged wheels and positioned by remote control, is an important component of the mechanized car-cleaning installation.

Great Northern Cuts Car Cleaning Costs

Adequate supplies of clean, top-quality cars are problems for most railroads. The Great Northern has gone a long way in solving its problem with a pushbutton production line car-cleaning system at Delta Yard near Everett, Wash. The facility turns out 200 cars per day in two 8-hr shifts.

A six-man crew operates the cleaning track on the two shifts five days per week. The new arrangement not only doubled the previous output, but also reduced the high cost of cleaning. Additional refinements are expected to further increase capacity. Later this year, Delta's salient features will be incorporated in a second cleaning system to be located on the east end of the line where a plentiful supply of grain, flour and sugar cars are needed. The Delta set-up processes cars for paper pulp and lumber loading in coastal British Columbia to the north, for the Seattle and Longview, Wash., areas to the south, and for Spokane to the east.

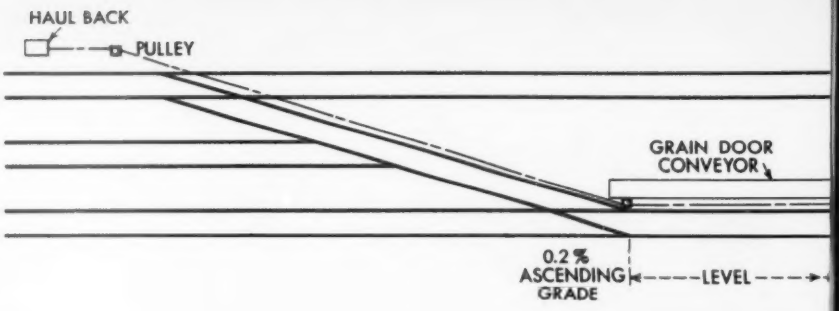
The system has three storage tracks with a capacity of 100 cars. These tracks lead into a single car-cleaning track. Thirty-five cars can be handled at one time by the car puller. The production line consists of a grain door reclaimer, washer for gondolas, conveyor for removing debris, vacuum cleaner, and automatic box car washer. Two men are assigned to the vacuum cleaner, one at the washing station, and three to prepare the cars for cleaning.

One panel board makes it possible to control all functions of the clean-out process from a single station. Buttons sound the warning signal; activate the tow cable and its haul-back line; start and stop the vacuum cleaner; line up and operate the washer; start and stop the conveyor belts, and swing the discharge end of

the cantilever conveyor over the two incinerators.

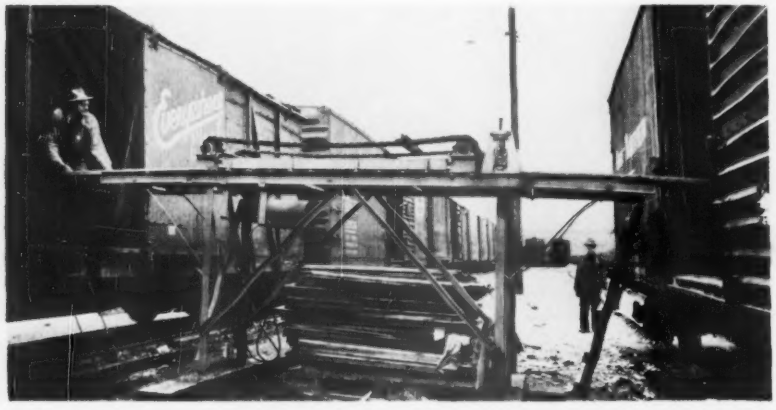
The storage tracks leading to the clean-out track are on a 0.2 per cent ascending grade. The track is level through the 250-ft work area and descends on a 0.35 per cent grade to the receiving yard. As the cars are pulled along the lead into the clean-out position, workmen remove all banding material from the walls and sides of car. Grain doors are pulled down and stacked at the doorway with the other debris. When the car is spotted at the grain door reclamation station, the grain doors are placed on a conveyor that extends into another car where the doors are stored. As the doors move along the conveyor, all protruding nails are automatically bent over by the rollers.

The car then moves to the clean-out station where the retractable shuttle conveyor and vacuum cleaner are used. The conveyor is moved into the car, all bulky material is loaded and moved to the main inclined conveyor and cantilever conveyor leading to the incinerators. If the car contains dust, grain, flour, or cement, the vacuum cleaner, which is mounted on two wheels, is rolled into the car from the opposite side.



One man controls the vacuum nozzle, while a helper keeps the 12-in. suction hose in the clear. The 7,500 cfm cleaner has a nozzle 5 ft wide, operated by a 50-hp motor with a 54-in. blade fan which generates a 14-in. vacuum. Material removed by the cleaner is carried to a hopper at its bottom. When the vacuum cleaner is shut off, a trap door at the bottom of hopper opens and discharges over the main inclined conveyor. The two incinerators burn the refuse as it comes off the cantilever conveyor. While one incinerator is burning, the other is being filled. This prevents conveyor damage which could result if it were swung over a lighted incinerator.

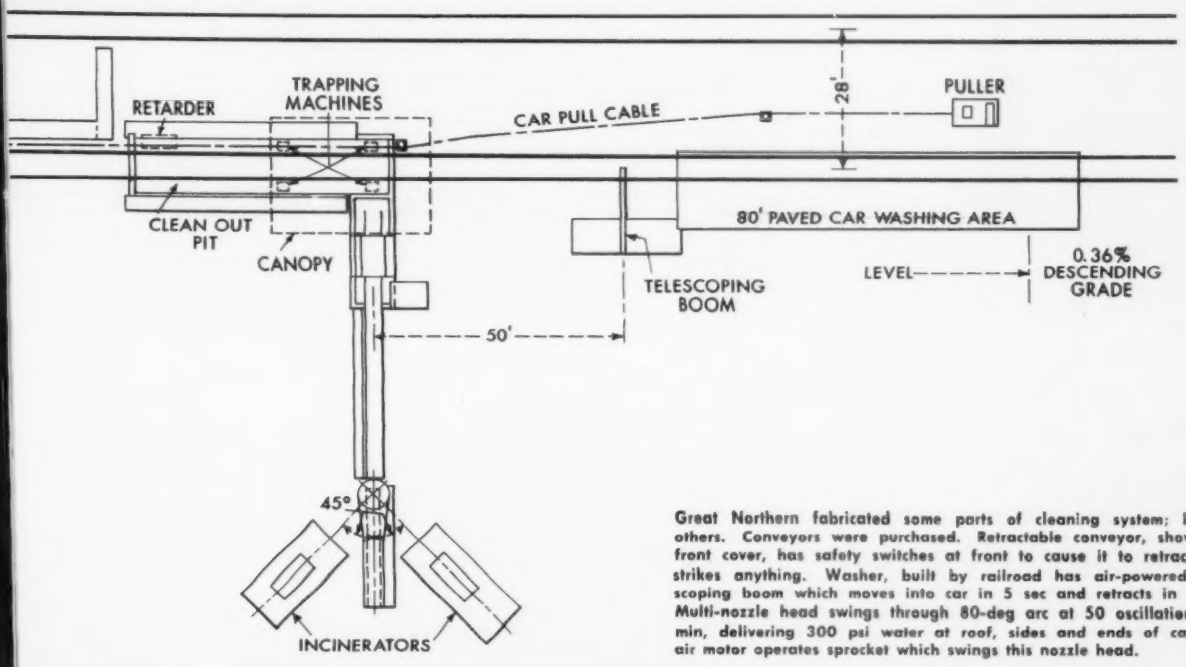
After the car is vacuumed, it is moved one car length to the washing station. Here the track is tilted 4 in. toward a paved area 80 ft long by 15 ft wide. Outlets from the edge of this



Grain doors from cars due for cleaning are moved on conveyor to an adjacent storage car.

Controls for the series of operations are located at platforms on both sides of track.

King-size vacuum cleaner has 5-ft nozzle which cleans entire width of car floor in two passes. Nozzle is handled by one man; vacuum hose by another.



Great Northern fabricated some parts of cleaning system; bought others. Conveyors were purchased. Retractable conveyor, shown on front cover, has safety switches at front to cause it to retract if it strikes anything. Washer, built by railroad has air-powered telescoping boom which moves into car in 5 sec and retracts in 7 sec. Multi-nozzle head swings through 80-deg arc at 50 oscillations per min, delivering 300 psi water at roof, sides and ends of car. An air motor operates sprocket which swings this nozzle head.

asphalt surfaced area drain into an adjacent swamp. An operator pushes a switch that engages the washer mounted on a telescoping boom. When the boom is positioned in the car, the water is automatically turned on, washing the complete interior.

At the washing station, the car is located at the top of a grade. After washing, it can make one of three moves. The majority go to an OK track. If the car is in need of steam cleaning, a Vapor Clarkson Upgrader is located on another wash track. A car needing light repairs can be switched to a third track. The entire process over the clean-out track is timed and approximately 2 min is allowed for each operation. The facility is well lighted. All operations are electrically interlocked from platforms on both sides of the track. Before any movement is made, a siren sounds.

Cars are pulled between the clean-out stations at 72 ft per min. The cable can move a string of 35 cars for

(Continued on page 44)

Components of Link-Belt conveyor are: 1) hose connection; 2) control panel; 3) intake hopper; 4) retractable conveyor; 5) 22-deg elevating conveyor; 6) cantilever conveyor; 7) incinerator.

Butane-fired incinerators, made from old locomotive tenders, are used for trash disposal.

Three-tube oil-level tube is applied to the crankcase side cover of the Gardner-Denver compressors to simplify measurement of lube oil.

Single-tube design is applied to the crankcase covers of Westinghouse 3-CD compressors to measure oil level with the engine running.

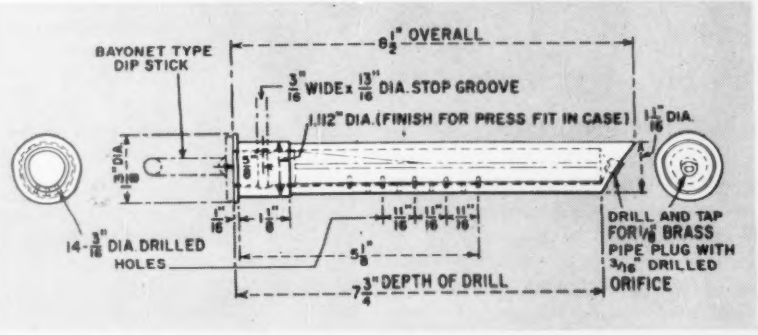
Measuring Compressor Oil Level

OIL-LEVEL INDICATORS on Santa Fe locomotives accurately measure air-compressor crankcase oil level while the diesel engine is running. Redesign of the original dip stick arrangements by C. E. Todd, retired assistant supervisor air brakes, made this possible.

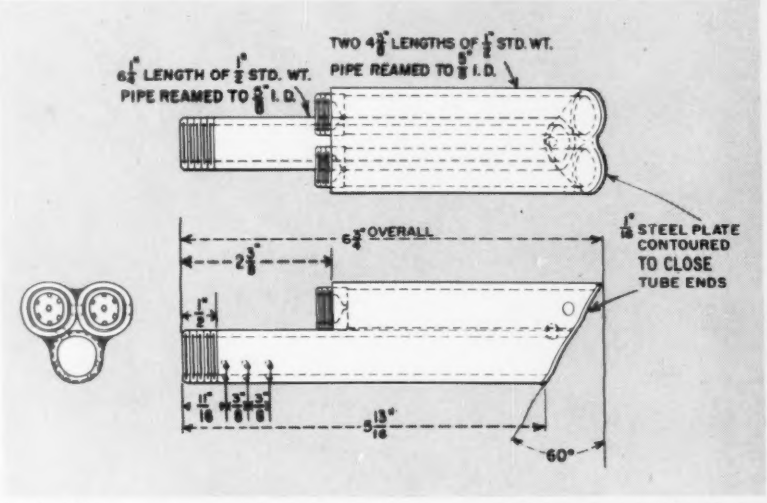
Two types of perforated dip stick tubes are required because of design differences between the Gardner-Denver and Westinghouse compressors. In the single-tube Westinghouse design, the length of the original bayonet gage is reduced ½ in. because of the 8-½-in. overall length of the oil-level tube. The three-tube arrangement for the Gardner-Denver takes the standard length dip stick.

The number, size and angle of the drilled ports in both tube designs are most important. They provide proper damping of the oil pulsation so a precise reading can be made. The oil should be warm and the bayonet gage left in the tube for four or five seconds after having been removed and reinserted, according to the Santa Fe.

This device was reported by the Committee on Locomotives at the AAR Mechanical Division meeting last June. Complications which can result from shutting a diesel down to check compressor oil level were mentioned in one of our recent Diesel Maintainer's Note Book episodes (More Than Magic to Keep This Diesel Running, August 1959, p. 60).


BAYONET TYPE DIP STICK
8½" OVERALL
3/16" WIDE x 13/16" DIA. STOP GROOVE
1.112" DIA. (FINISH FOR PRESS FIT IN CASE)
1 1/16" DIA.
14-3/16" DIA. DRILLED HOLES
5 1/8"
7 3/4" DEPTH OF DRILL
DRILL AND TAP FOR 1/8" BRASS PIPE PLUG WITH 3/16" DRILLED ORIFICE

Westinghouse Air Brake compressor oil-level dip-stick tube, must provide accurate fit for original dip stick. Units are fabricated by Santa Fe shops for road's 3-CD compressors.


6" LENGTH OF 1/2" STD. WT. PIPE REAMED TO 5/8" I.D.
TWO 4 3/8" LENGTHS OF 1/2" STD. WT. PIPE REAMED TO 5/8" I.D.
6 3/4" OVERALL
2 5/8"
1/2"
1/16" STEEL PLATE CONTOURED TO CLOSE TUBE ENDS
5 13/16"
60°

Gardner-Denver compressor oil-level dip-stick tube is assembled from three lengths of pipe, two brass pipe plugs with 1/16-in. orifices, and plate to close bottom of the assembly.

CORRELATED UNITS MAKE HOPPERS

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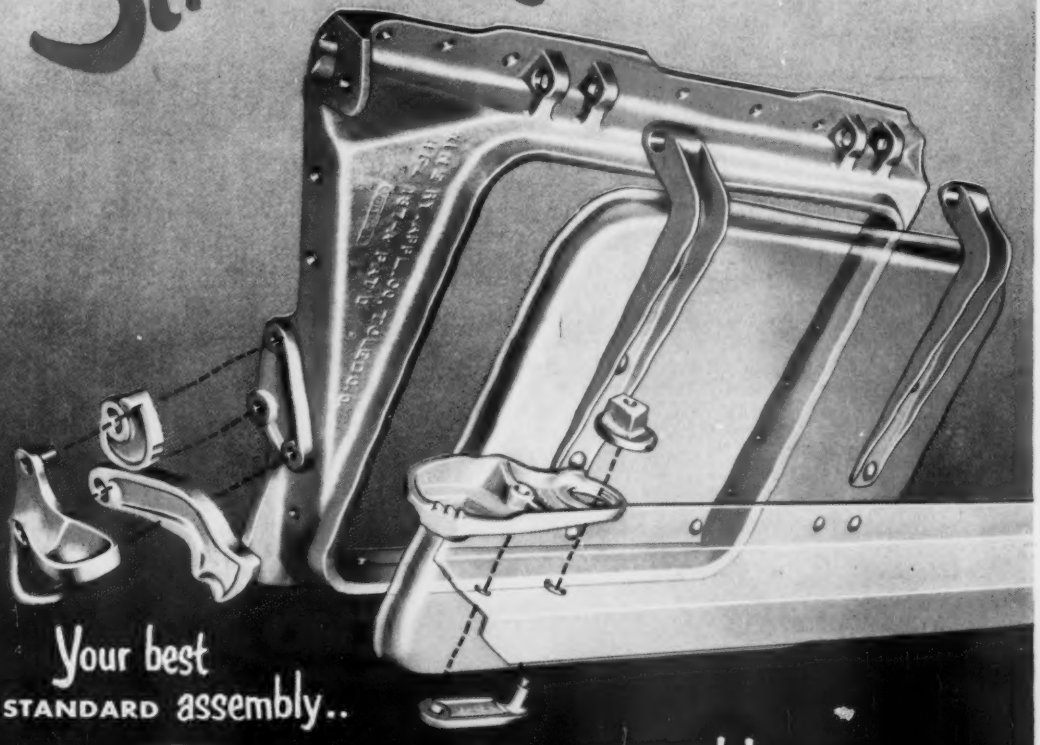

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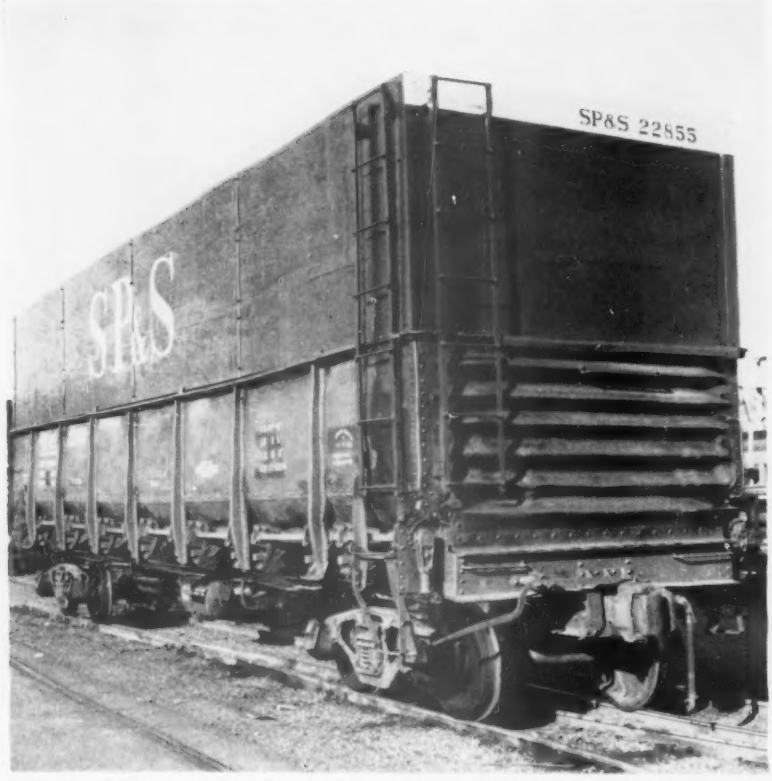
Converted for Expanding Traffic . . .

SP&S Chip Cars Have Plywood Sides

Wood side posts are placed at three points along each side of the car during conversion. Plywood panel still has to be installed at car end. Tubular crossties go between tops of wood posts.



High sides give these drop-bottom gondolas a capacity of 4,119 cu ft—a volume which makes chip movement economical. Plywood side panels extend full 41-ft 6-in. length of the car body.

Large plywood panels have been used by the Spokane, Portland & Seattle in the conversion of 25 drop-bottom gondolas for wood chip loading. The cars, with extended sides and ends, have a capacity of 4,119 cu ft, and are used primarily between SP&S points and mills at Longview, Wash. They supplement a fleet of 485 cars previously used in wood chip service.

The side and end extensions were designed to withstand the effects of using car shakers and other equipment to remove heavily-packed chip loads. Trucks and bottom doors were placed in good operating condition at the SP&S Vancouver, Wash., shop before conversion began. First step was application of 6-in. steel-angle corner posts at the ends of these 41-ft 6-in. gondolas. Six 6 x 8-in. fir side posts were then installed, three on each side of the car. The 6-in. side of each post is installed against the car side and each post is secured by two ¾-in. U bolts.

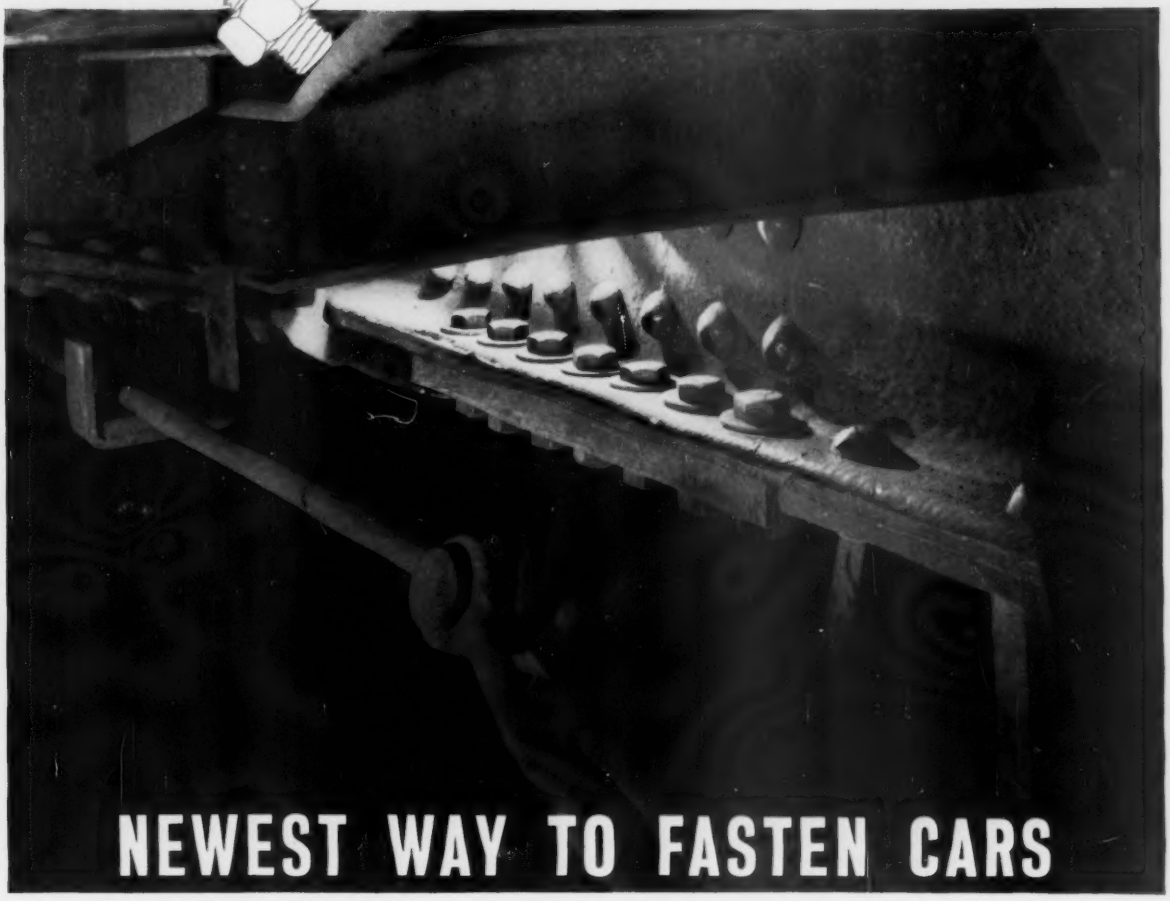
The car side and end extensions are made of 1-in. Douglas fir plywood supplied by the Diamond Lumber Co. of Portland, Ore. An unusual feature is that the side panels, one 2 ft wide and the other 4 ft wide, are made in single sheets 41-ft 6-in. long. It is believed these are the longest plywood panels ever made for use in railway equipment.

The 2-ft panel, first applied above the steel car side, is grooved 1-in. deep at the top to receive a tongue milled on the bottom of the 4-ft. wide panel applied above. The tongue and groove joint is made with Weldwood waterproof glue and both panels held in place by ½-in. bolts spaced 12 in. apart through each corner and side post. To give added strength ⅛-in. by 2-in. steel strips are placed between the plywood and each row of bolt heads.

Riveted handholds are removed from the original cars and ladders with angle iron stiles applied to the chip-car sides and ends. The hand brake wheel is raised and applied in accordance with safety appliance rules. The cars are given two coats of synthetic red freight-car paint and standard SP&S stenciling.

R B&W high strength bolts...

115th year



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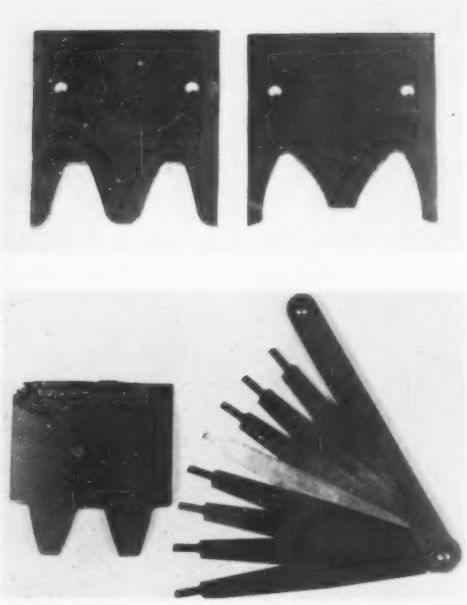
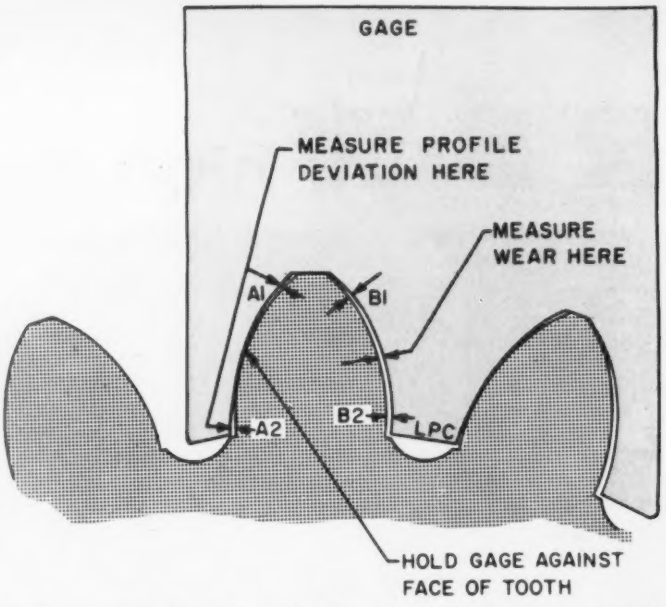


Steel profile gages (upper) can be used for gear checks. Steel-reinforced plastic gage (lower) can also be used with the special narrow (⅛-in.) feeler gage, or with a wire gage in measuring gage-to-tooth clearance.



Template gages can be used to check profile and measure reduction in tooth thickness at same time. For long gear life, investigators recommend this program: 1) Check regularly; 2) Condemn when necessary; 3) Reclaim when possible; 4) Lubricate consistently; and 5) Maintain adequately.

What To Do About Traction Gear Wear

Findings of PRR test program with electric locomotive are applicable to all spur-type traction gears

Importance of maintaining traction-gear tooth profile and the amount of salvage grinding which is practical have been determined by the Pennsylvania and General Electric. A study of electric-locomotive operation on the Pennsylvania indicated the need to reduce traction-motor failures. Analysis of records showed that half the locomotives shopped for running repairs were sent in because of motor breakdowns. Of these, approximately 44 per cent were attributable to mechanical fatigue and insulation disintegration.

Close examination of failed components uncovered evidence of severe vibration which manifested itself as cracked and broken shafts, slipped pinions, bearing failures, broken armature heads, and worn or powdered insulation. Patterns of the failures were characteristic of the combined stresses that result from torsion and bending. As a result of wear, gears with teeth varying considerably from their correct involute profile were in service. Defective gearing was suspected as the source of the damaging vibrations.

Generally, the condemning wear limit has been based exclusively on tooth thickness and strength. Minimum dimensions usually measured at tooth tip were aimed at prevention of tooth breakage. No account was taken of the dynamic effects of deviations from correct tooth profile and their destructive influences on the entire drive system.

The program investigated the relationship between defective gear-tooth profile and equipment failure so maintenance practices could be altered.

Included as part of the test program was an evaluation of the dynamic loads, stresses and deflections resulting from defective gearing. The stresses or displacements in the components were measured over typical main-line track in a locomotive operated by a regular train crew. Gear combinations representative of new, partially worn, badly worn, and "salvage-ground" gearing were tested. The term "salvage-ground" refers to gearing having excessively worn teeth ground to restore satisfactory tooth profile. (See GE Restores Traction-Gear Tooth Profile, RL&C, June 1959, p. 42.)

The testing was conducted by the PRR test department. Engineering representatives from GE participated as consultants in planning the program, collecting data and analyzing results.

Tests were conducted with a 4,620-hp GG-1 electric locomotive equipped with six twin-armature, quill-drive, a.c. series motors geared for 90 mph maximum speed. The unit was assigned to the program after class repair. The test-motor assembly was located in the number four drive position.

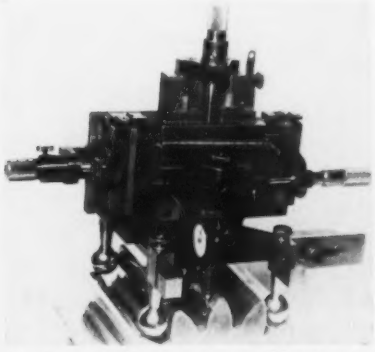
The motor-test assembly was completely rebuilt under close supervision

Based on paper, "Dynamic Stresses in Traction Motors Resulting from Defective Gearing," by E. E. Greene, General Electric Co., and M. A. Pinney, engineer tests, Pennsylvania, presented at recent ASME annual meeting.

at the railroad's main shop. Gear mounting and locomotive assembly were done at the electric-locomotive shop. Maximum precautions were taken to hold proper gear centers on the instrumented motor-and-drive assembly. Motor components were instrumented with wire-resistance strain gages or strain gage activated load cells.

Initially, the test locomotive pulled maximum train allotted to a single unit of this class in freight service. Examination of the records indicated that train size, track contour and road-bed characteristic had no significant effect upon results. To accelerate the program and reduce costs, testing was confined to the locomotive pulling a single car between the Wilmington, Del., electric locomotive shop and a wye at Perryville, Md.

Several combinations of gearing with a wide range of profile error were mounted on the test armatures and quill. Each set was tested over the normal operating speed range at three different values of motor current. The tooth profiles on all specimen gears and pinions were measured with a coordinate profile gage.



Coordinate profile gage was used by gear inspectors to secure accurate contour records.

Effects of the three major variables—tractive effort, speed, and profile deviation—were determined. The first two were simply a matter of locomotive control. The third was accomplished by changing gearing combinations. Four basic sets were selected on the basis of their degree of deviation from correct tooth profile. One combination had a backlash of 0.220 in. and the other a backlash of 0.284 in. Nominally, the backlash is 0.050 to 0.060 in. No detrimental effect was recorded. The salvage-ground specimens were well within tolerances for correct profile. This means that large values of backlash have no detrimental effect on armature and other drive parts, if tooth profile is correct.

The armature shaft, because of its size and location, represented the best source of experimental data. Shaft torsional stress, being independent of shaft position, was least likely to prevent timing difficulties. It was found that the magnitude of the dynamic effect is approximately directly proportional to the tractive force. If the gearing profiles were correct, there would be no dynamic effect and the speed-stress relationship would be a straight horizontal line and independent of locomotive speed. With profile error, the relationship assumes a wave shape. When the frequency of blows corresponds with a system critical, the peaking effort follows. Three such criticals were encountered in the range tested.

One of the most important observations to be made on these curves concerns these peaks. Their height is, of course, limited by the amount of damping in the system. Because friction supplies most of this, it is essential that fits and tolerances be maintained. If they are not, minor deviations from correct profile will surely shake the armature to pieces.

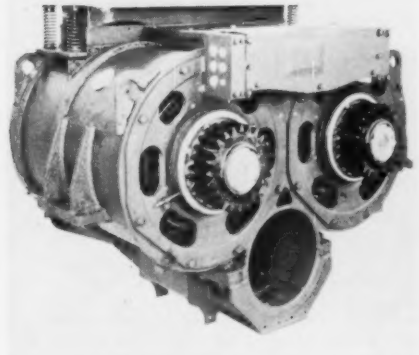
The data shows that a dynamic multiplier is present at speed under tractive effort when there is an error in the gear-tooth profiles. The tests show that when current is removed, the vibration ceases immediately.

Deviation from profile is not the only source of profile error. Tooth deflection and variations in gear centers are contributing factors that account in some degree for the behavior observed.

Dynamic Effects

Field testing substantiates the theory that departures from correct gear-tooth profile create dynamic effects which subject the mass elastic drive system to many times normal loading. This increased loading will cause premature failures of mechanical components and electrical insulation. A dynamic multiplication as high as five times normal was observed. If more pronounced departure from profile, or higher speeds were tested, a more severe effect could be expected. However, this increase in severity has limitations. It depends upon the length of time available between successive gear-tooth contacts. When the system departs from a gear drive and approaches that of a spoked wheel driven by a stick, the dynamic effect vanishes. This point was not reached at any time during this test program. Therefore, it must occur above the speed limit for freight service and allow for more severe dynamic effects in passenger service.

Significant multiplication begins to occur when departure from profile ex-



Twin-armature GEA-627 GG-1 a.c. motor was instrumented to reveal effects of out-of-profile gear teeth.

Pennsylvania 4,620-hp GG-1 a.c. electric locomotive was operated on test runs which showed how speed and current affected armature shaft stresses.

ceeds 0.005 in. In the range from 0.005 to 0.015 in., loading increases rapidly from normal to as high as three times normal. Above 0.015 in., there is a continual increase in severity of load, but at a lower rate and the relationship between dynamic effects and departure from standard profile is almost linear. The dynamic multiplication factor is a linear function of tractive effort and a higher power function of locomotive speed.

With gearing tested, three critical frequencies are encountered between standstill and 55 mph. The presence of critical speeds emphasizes the need to maintain component fits so there will be maximum damping. Critical speeds can be altered by adjustments in motor rpm, the number of teeth on the pinion gear, and the stiffness and inertia of the drive system.

Significant motion was observed in the pinion-end armature windings with very small profile deviation. In order to minimize chafing and wear of insulation in this region, every effort must be made to maintain adequate binding wire tension.

The field-test results indicate that gearing with departure from correct profile of 0.015 in. or more should be considered unserviceable and that gearing with 0.005 in. or less departure from correct profile is definitely serviceable. In the range between these limits, and possibly beyond, economic considerations must be factored into any interpretation, balancing between preventive maintenance and failure costs.

Apparently a condemning limit of 0.015 in. departure from correct profile should be established for locomotive gears and pinions. Gearing should be checked at every opportunity. All pinions on motors in for repair or reconditioning, and all gears on spare wheel assemblies should be measured. Gear cases should be checked once a month. If the gear lubricant is found to be low or unserviceable, deterioration of tooth profile can be expected.

The Pennsylvania is now measuring and recording the condition of the gearing which is being used in the locomotive fleet and correlating this information with the service performance of motor and drive assemblies.

A method of measuring tooth profiles must be set up for shop use. Template type gages should be used. They can be made of steel or steel-reinforced plastic. These gages are placed over the tooth, and the profile is checked with a specially prepared feeler gage. When a ground outside diameter is available on the gearing, it is an excellent reference for template gages, provided care is taken to remove all metal which may have been wiped over the gear-tooth tip from the gear-tooth face.

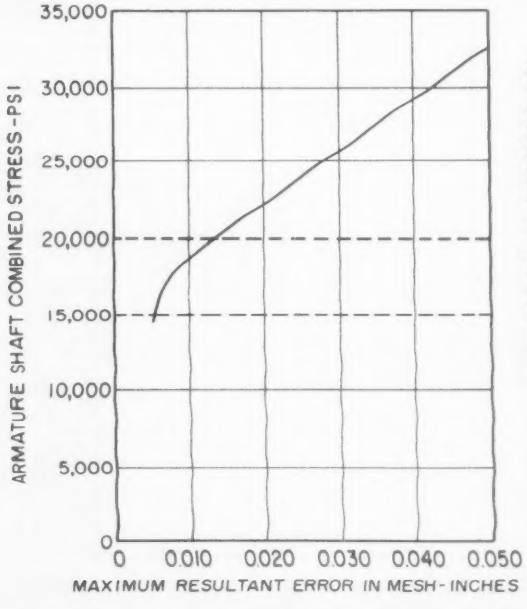
Profile deviation is measured on the side of the tooth against which the gage is making contact. Use a narrow feeler gage (maximum width 1/8 in.) or a wire gage to measure the maximum clearance between the side of the tooth and the profile gage. The template gage should be scribed with a line stamped LPC (lowest point of contact). The deviation from profile should not be taken below this point. Contact below the LPC is indicative of incorrect gear centers. With gears, the gage can be brought into position from the top of the teeth. With pinions, it may be necessary to slide the gage into position from the ends of the teeth.

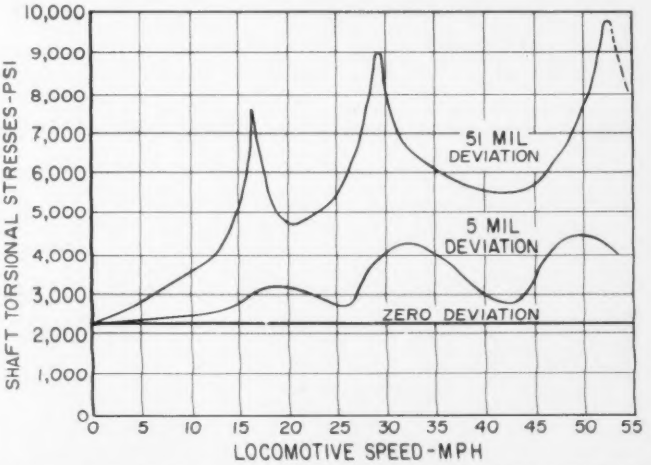
Template gages can be cut with the trochoid of the mating member below the LPC line. Contact along the trochoid will indicate interference with the mating member. The interfering material should be removed before the pinion or gear is returned to service.

No distinction between pinions and gears should be made when evaluating tooth profile. The departure from profile of consequence is that which results from the engagement of the mating pinion and gear teeth. Dynamic effects are the result of a violation of the law of conjugate action. It matters little whether the violation originates in the pinion or the gear.

When two gears with worn teeth are mated, the effects of the individual departure from profile are modified. The degree of modification depends upon the degree to which the errors are matched. If the mating teeth are out of profile approximately the same amount and in the same direction, the resultant error will be reduced greatly. The effect vanishes if the difference in error is large. Little

(Continued on page 40)





Combined stresses in armature shaft (left) increased rapidly with profile deviation. Speed was 52 mph; current, 2,400 amp. The SAE 4140 steel in shaft has an endurance limit range of 15,000 to 20,000 psi, shown by the dotted lines. The "zero deviation" gear set (above) has no effect on torsional stress; out-of-profile sets show presence of dynamic multiplier. The "zero deviation" gears were salvage-ground with intentional backlash but accurate profile. Result was "no adverse effect of any significance."

ANNUAL REPORT

TO THE RAILROADS

PRODUCTS AND SERVICES

NATIONAL
MALLEABLE AND STEEL
CASTINGS
COMPANY

Transportation Products Division
Cleveland 6, Ohio
In Our 92nd Year of Service to Transportation

IMPACT AND DRAFT GEARS

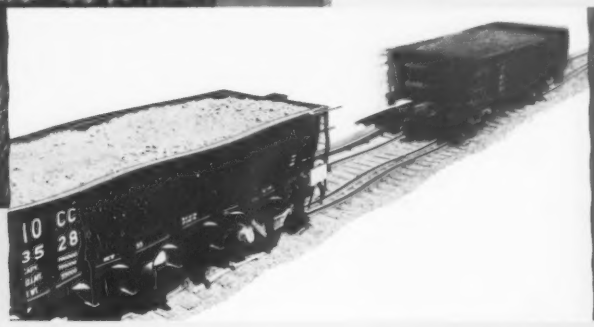
Conclusions After 5 Years of Car Impact Tests

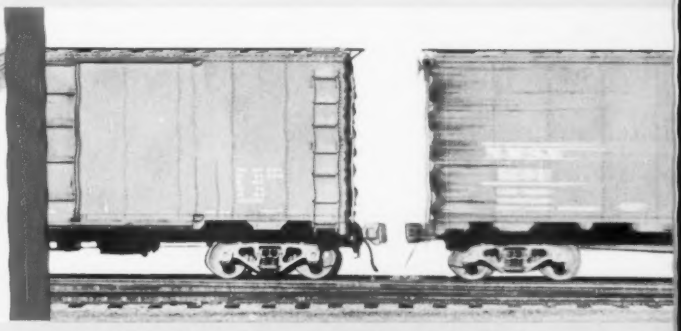
Data obtained from the 5-year impact tests have been compiled, analyzed and studied. These data were presented, in the form of a comprehensive paper*, to the ASME at the Society's annual meeting in Atlantic City in December, 1959. The report, which includes test data on all types of draft gears and sliding undersills, has received much favorable comment for the frankness of its conclusions and for the light it sheds on the important problem of car impacts.

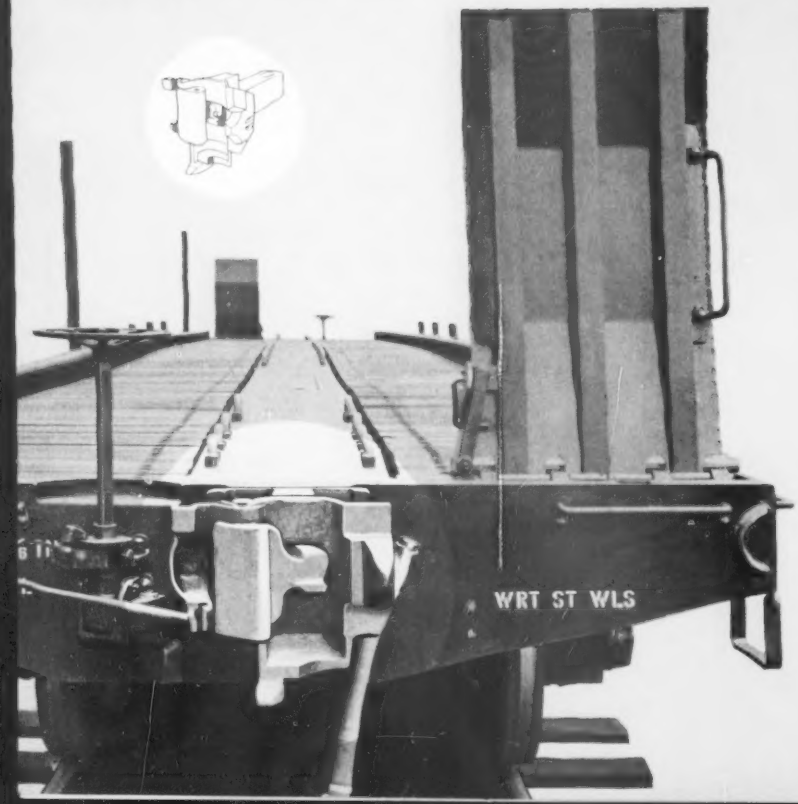
These basic conclusions are drawn by the report:

1. Conventional tests of draft gears do not necessarily indicate their ability to protect car structures or lading.
2. Draft gears having conventional operating principles, including 36-inch pocket gears, cannot be expected to provide important benefits to lading.
3. Cushioning requirements are different in cars that carry merchandise from cars carrying bulk lading.
4. Only sliding center sill cars with adequate cushioning can be expected to give really adequate protection to easily damaged boxcar lading.

During 1959 several of National's new and still-to-be-introduced draft gears were put through their final testing, while initial service tests were begun on a modern concept in car cushioning.







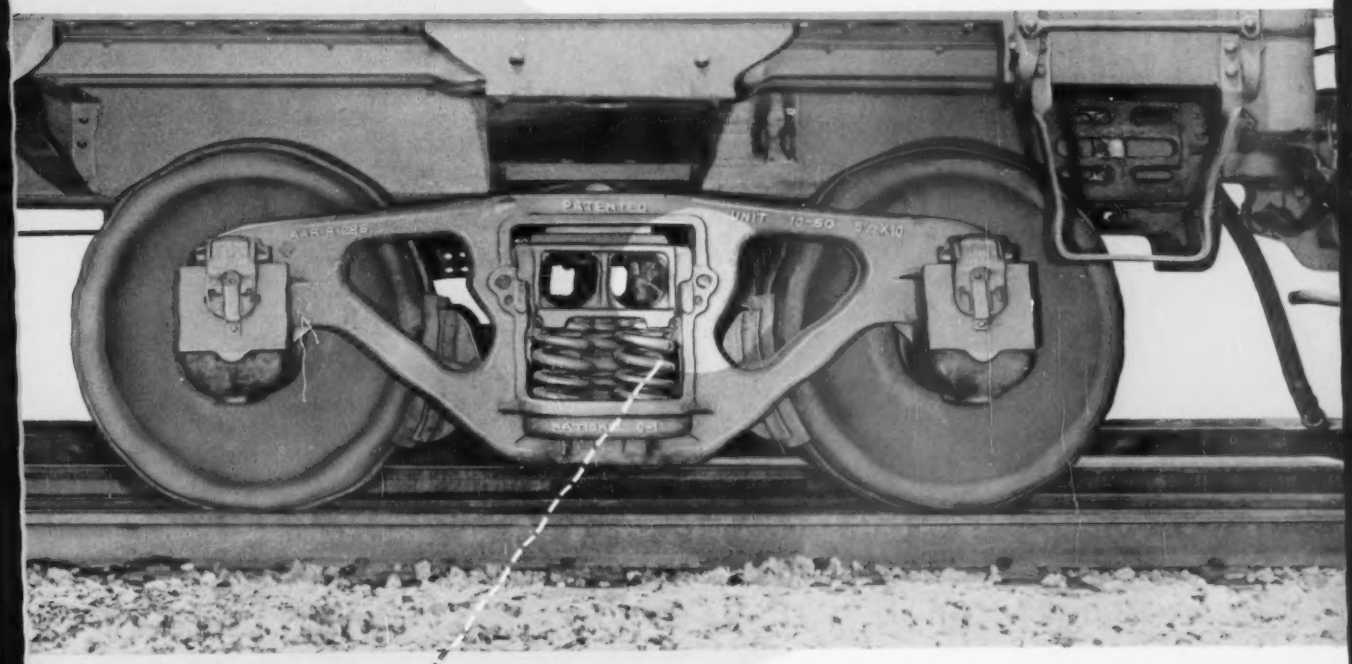
COUPLERS AND COUPLER SERVICE

During 1959, National service engineers paid numerous visits to various railroad installations regarding coupler applications and coupler service conditions. In addition, National's Technical Center saw practically monthly meetings of the Mechanical Committee of the Standard Coupler Manufacturers regarding studies which have resulted in improved and strengthened Type E and Type F coupler shanks and contour modifications. Other Committee projects were initiated during the year for the improvement of couplers that would provide longer service life under both normal and abnormal conditions.

Also, during the past year, National shipped its 13,000,000th knuckle-type automatic coupler.

*"*Impact as Related to Freight Car Lading Damage*," W. E. Baillie, National Malleable and Steel Castings Company (ASME Paper No. 59-A-249).

FREIGHT CAR TRUCK ACTIVITIES



The thirtieth C-1 truck inspection was performed in 1959. With very few exceptions, all inspections were performed on the actual properties of railroads using National C-1 trucks. Twenty-five different railroads were visited, with railroad personnel present to witness the inspections. C-1 trucks used in every type of car and under every possible type of service have been checked in this continuing series of investigations.

In each case, the inspections have borne out National's long-time contention: That the basic, unchanged design of the C-1 friction control mechanism provides superior riding qualities with long wear life of component parts.

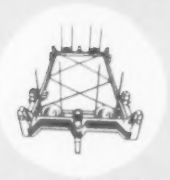
The response of railroad men to the witnessing of these inspections and to the analysis of the inspection reports is evident in the increasing number of National C-1 truck orders.

RESEARCH FOR RAILROADS AND INDUSTRY

Periodically during 1959 quality control tests were run on National specialties to assure the highest standards of service operation. Numerous other test programs were also conducted on new products for all divisions of National.

In addition to National's product research and testing programs, a number of projects were handled for individual railroads and industries. Among these tests were: Shakeout fatigue tests on 70-ton hopper cars, ore drop tests on a new design of 70-ton hopper car supervised and run by Technical Center personnel on the client's property, impact tests on inflatable dunnage, on rubberized liquid containers, and on boxes of glass bottles using different types of paper separators. These programs were performed under individual contracts. National invites railroads and other industries to avail themselves of the facilities of the Technical Center.

NATIONAL SPEEDLOADER SYSTEM

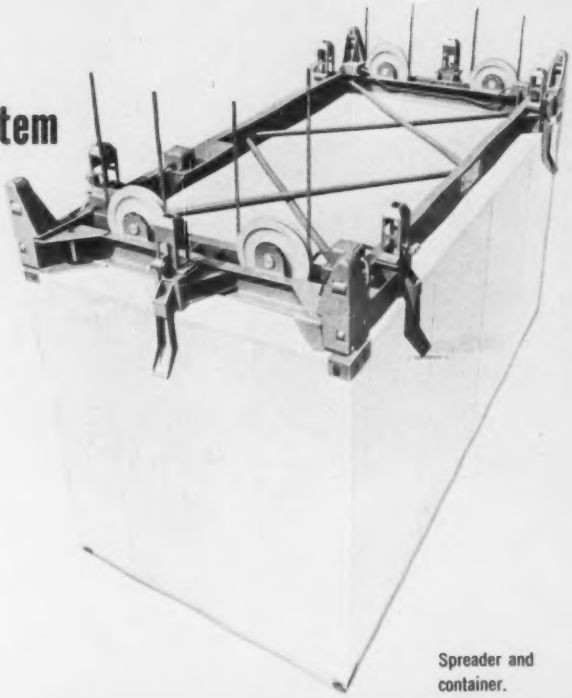


A New Cargo Container Handling System Introduced in 1959

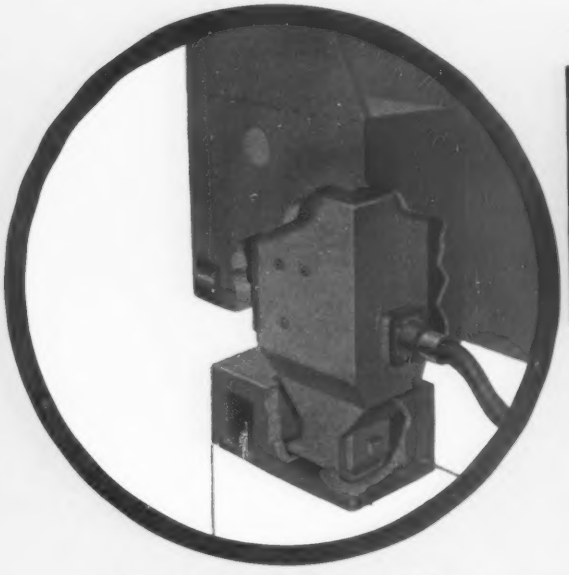
The newest of National's products for the transportation field, it is the first complete fully automatic cargo container handling system to be offered to all carriers and shippers.

Adaptable to any container, crane or vehicle, National supplies only the essential Speedloader components to commercial producers of these items. That means users can purchase their cranes from any crane manufacturer, their containers from any container manufacturer.

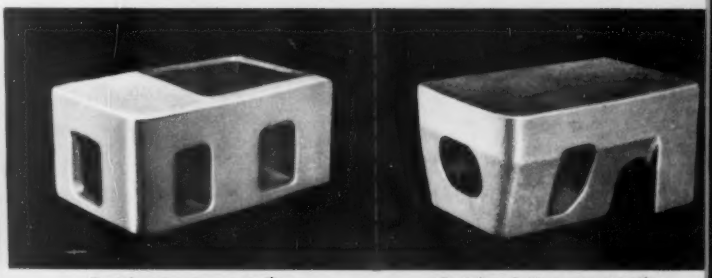
Components comprising the system include: Spreader for crane complete with coupler-latches and wired for automatic operation, top and bottom container corner castings, and anchor castings for fastening containers to flatcar, truck, barge or ship deck.



Spreader and container.



The principle involved, that of locking the container to the crane spreader, is the same principle as that of the railroad coupler except that the coupler-latch has a rigid knuckle which locks into a recess in the container top corner casting.



Container top corner casting.

Container bottom corner casting.

NATIONAL
MALLEABLE AND STEEL
CASTINGS COMPANY

Established 1868

Transportation Products Division
Cleveland 6, Ohio

International Division Headquarters
Cleveland 6, Ohio

CANADIAN SUBSIDIARY
National Malleable and Steel Castings Company of Canada, Ltd. Toronto 2-B, Ontario

GEARED TO PROGRESS
P R I
MEMBER

COUPLERS · YOKES · DRAFT GEARS · FREIGHT TRUCKS · JOURNAL BOXES
NATIONAL SPEEDLOADER CONTAINER HANDLING SYSTEM

A-749A

Mobile test car had top reinforced to prevent damage when unit is used in locations where it must be driven close to freight cars. Cathode ray tube placed at the driver's right simplifies inspection procedure. Sperry has recently announced further improvements in unit.

Mobile Units Check Car Axles

Mobile reflectoscopes have detected a faulty axle on one of every 363 cars inspected over 65-month period

After 65 months of service, the mobile reflectoscope carriers operated by the Chesapeake & Ohio have proved to be practical and economical. Experience has shown that they make possible efficient tests of solid bearing journals in place under cars.

In 1952 the C&O had a costly freight-train wreck caused by a break in a journal which started from a crack. The railroad had followed the AAR rules for magnetic-particle testing of journal surfaces in all plain-bearing axles before they were placed in service. Following the wreck, it was decided that this form of test was not sufficient to eliminate defects which occur after cars are placed in service. Consideration was given to the use of the Sperry ultrasonic reflectoscope for the rapid in-place inspection of car-axle journals. A program of investigation was set up to prove whether the reflectoscope would be practicable.

After considerable development by the C&O and Sperry, the first mobile detector went into service in 1954. Since then, the C&O has installed 19 additional units at car repair tracks. There have been a series of design improvements in both the vehicles and detection equipment (RL&C, Sept. 1955, p 74).

Operation of the mobile reflectoscope carrier demonstrated its value to such an extent its construction and sales were taken over by the Sperry Rail Service. Improvements made by Sperry Rail Service in cooperation with the C&O included an extended cowl for the reflectoscope and a hood on the fender-mounted auxiliary screen for a clearer view of the cathode-ray tube.

Several improvements have been made during the past year. It was found that the mobile carrier incurs considerable body and top damage. This is because it operates very close to the cars being inspected. If the wheels of the mobile carrier run into a road hole, the top of the mobile carrier will strike the side of the railroad car, breaking the top.

The fenders are made of heavy steel. Bumpers are of channel iron and heavy plate. The sides of the top are protected by heavy steel tubing. This type of construction should give longer useful service life.

It has been found that the gasoline-driven, 60-cycle, 110-volt, a.c. generator was very expensive to maintain. It also adds considerable weight to the mobile carrier. Experiments showed that a 12-volt, 30-amp, d.c.

From a paper presented before the Railroad Division at the annual meeting of the ASME in Atlantic City, N. J., November 30-December 4, by M. F. Melrose, assistant engineer of tests, and T. E. De Vilbiss, supervisor of non-destructive testing, Chesapeake & Ohio.

generator could be powered by the gasoline engine which drives the carrier. This generator would furnish enough current after being rectified with transistors and multiplied to give 110-volt, a.c., 60-cycle current to operate the reflectoscope.

Another improvement altered the search units to give longer life. Wear on the crystal caused by the rubbing against the end of the car journal required frequent replacements and proved costly. A ring screwed type arrangement was designed to fit tightly over the search unit. On top of this ring a piece of 3/16-in. plastic was affixed with four soft bronze screws. This made one side of the plastic the wearing side and the other side was tight against the crystal face. With this arrangement, the signal could then be carried to the journal through the plastic wearing plate. It was found that the present signal was not strong enough to pass through the plastic wearing plate; the intensity of the signal strength had to be amplified. After a large number of experiments, it was found that the signal strength intensified to successfully pass through the plastic by using a television peaking coil. To package this peaking coil in the search unit without making it bulky was somewhat of a problem. However, it was solved by insulating the small peaking coil in a plastic insulating tube with a screwed connection at one end attached to the coil wire. The peaking coil was then screwed into the transducer neck plug connection with a special wrench. The other wire end of the peaking coil was soldered to the lead going to the reflectoscope.

MOBILE UNIT LOCATION	NO. IN SERVICE	DATE PLACED IN SERVICE	TOTAL NO. CARS INSPECTED	CRACKED OR DEFECTIVE JOURNALS FOUND			NO. CARS INSPECTED PER CRACKED OR DEFECTIVE JOURNAL
				C & O	FOREIGN	TOTAL	
NEWPORT NEWS, VA.	2	6-54; 12-54	56,245	102	64	166	339
RICHMOND, VA.	1	1-56	10,685	22	26	48	223
CLIFTON FORGE, VA.	1	12-55	21,302	27	23	50	426
HANDLEY, W.VA.	1	1-56	15,748	42	20	62	254
PEACH CREEK, W.VA.	1	1-56	11,622	30	4	34	342
HUNTINGTON, W.VA.	1	1-56	15,386	11	25	36	427
RUSSELL, KY.	1 (A)	1-56; 8-55	17,563	29	70	99	177
ASHLAND, KY.	0 (A)(B)	1-56	9,700	14	18	32	303
STEVENS, KY.	1 (A)	8-55, 1-56	23,793	25	17	42	567
PERU, IND.	1	1-56	10,523	16	15	31	339
COLUMBUS, O.	2	12-53; 12-54	81,302	148	91	239	340
WALBRIDGE, O.	2	8-55; 8-55	43,073	20	21	41	1051
GRAND RAPIDS, MICH.	1	8-55	14,739	53	14	67	220
FLINT, MICH.	1	12-55	10,148	13	18	31	327
SAGINAW, MICH.	1	8-55	21,992	18	6	24	916
TOTAL OR AVG.	17		363,821	570	432	1002	363

Operations of mobile reflectoscopes at 15 car repair tracks over 65-month period yielded 363 defective axles. Ashland track (B) was closed in 1958. Its unit, along with one from Columbus and one from Stevens (A) now make up a pool of three spares to protect other operations.

Successful operation of mobile reflectoscope units depends on adequate supervision. On the C&O a supervisor of non-destructive testing trains operators and checks them from time to time to ascertain if they perform their work properly. His duties include rechecking of all defective axles removed from cars with the reflectoscope and seeing that all of the mobile units and reflectoscopes are kept in serviceable condition.

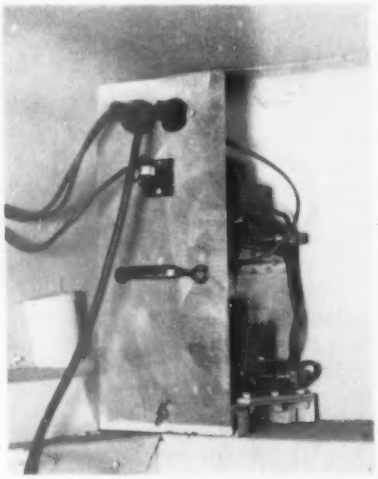
The C&O reflectoscopes journals under freight cars in the repair yards. When the journals of a C&O freight car have been reflectoscoped, the car is marked on each side with a stencil, illustrating a small streak of lightning. Over the top of this stencil is the station symbol and month and, underneath, is the year the journals were reflectoscoped. If the car again appears on the repair track in less than 90 days, the journals are not reflectoscoped.

The first mobile reflectoscope unit was placed in service at Columbus, Ohio, in December 1953, after which nine others which were shop constructed, were added. However, after November 1955, ten other mobile carriers built by the Sperry Rail Service were added to the fleet. This made a total of 20 mobile reflectoscope carriers assigned at locations over the C&O. Only 17 mobile units are now assigned over the road. The other three units are used as replacement units when a failure occurs to one in service.

Over a 65-month period, C&O mobile reflectoscope units checked 363,821 freight cars, both company owned and foreign. Among these, 1,002 cracked or defective journals were found. In foreign cars, the number was 432; in company-owned cars, 570. This makes one faulty journal in every 363 cars, or one in every 1,452 axles inspected. Should this average be representative of all the rolling equipment in the United States, there are a lot of faulty axles in service, according to the C&O.

There is no definite trend. Some of the car repair points have checked a large number of cars, locating only a few defective axles, while other points have reflectoscoped a relatively few axles and located a larger number of defective axles.

Plastic face was installed over the Sperry transducer for protection and longer life.



Signal strength of transducer was stepped up with this transistorized converter on unit.

M-F lading strap anchors arouse interest at suppliers' show.

COMPLETE LINE FITS ANY CAR CONSTRUCTION, CAN BE USED WITH STEEL OR ALUMINUM LINING

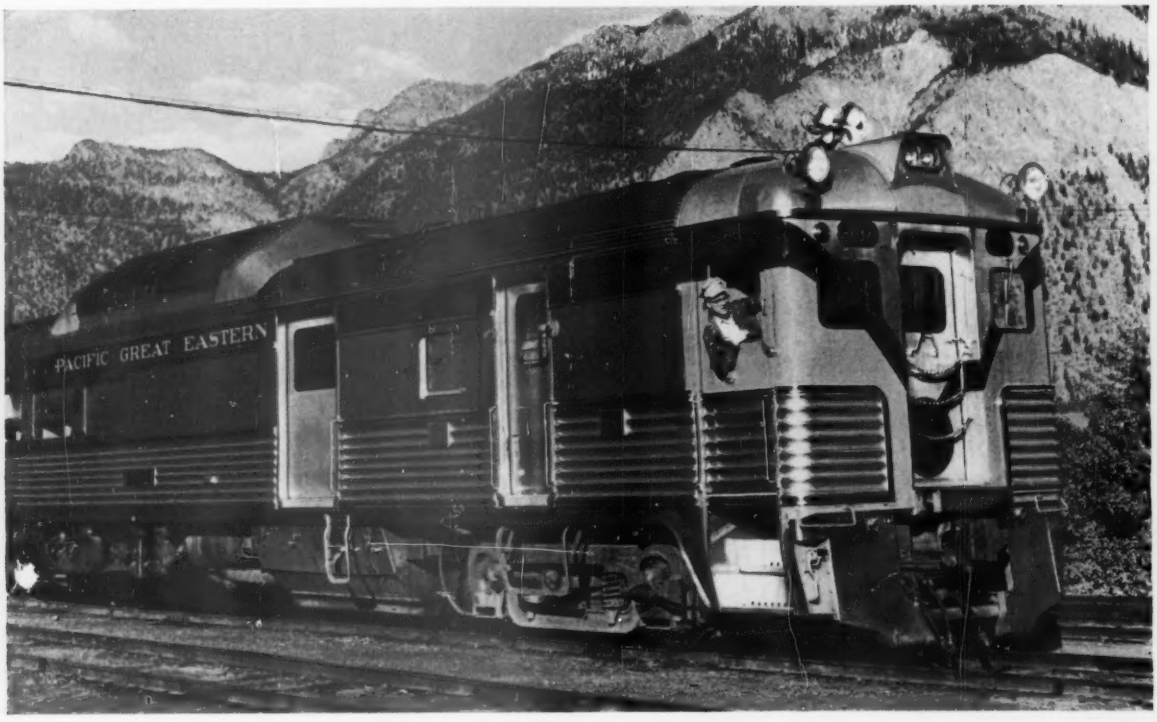
The M-F Continuous Bar Anchor, introduced only a short time ago has already proved its value in many steel lining applications. Many thousands of car sets are already in service. This anchor is supplied in standard 12, 18, 21 and 36 inch lengths with from 2 to 6 openings for strap application.

M-F has a complete line of anchors, including door post anchors and anchors for freight, gondola, or flat cars.

"WHATEVER THE QUESTION, M-F HAS THE ANCHOR!"

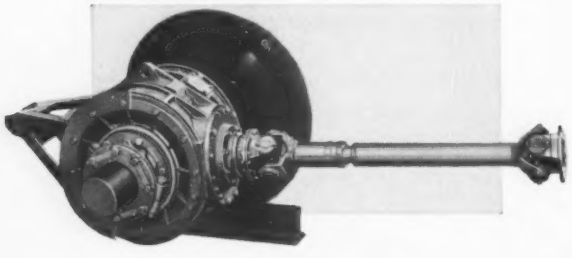
M·F **MACLEAN-FOGG LOCK NUT COMPANY**
5535 N. Wolcott Avenue • Chicago 40, Ill. • EDgewater 4-8420
IN CANADA: THE HOLDEN CO., LTD., MONTREAL

Spicer Model 8 is "the only drive that will do the job" for Budd



Favored the world over for their ability to reduce costs and improve service, Budd self-propelled Rail Diesel Cars are 100% equipped with Spicer Axle Drives. Budd says, "We use Spicer Model 8 drives exclusively, simply because they're the only type on the market that will do the job."

That job is to transmit power from the diesel engines to the wheels, and is accomplished by a pair of Spicer drives which are mounted directly to the axles.



Especially designed for this type of service, Spicer Model 8 drives are self-contained units employing spiral bevel gears and anti-friction bearings which are constantly running in a bath of oil. No adjustments are necessary since the gears are matched and aligned at the factory . . . after which they are lapped-in, checked and sealed for absolute protection against ballast, dirt, snow, water, and sleet. As a result, Spicer Model 8 drives have a service expectancy of 1,000,000 miles before a major overhaul.

For the maximum in high efficiency, economy, safety and quiet operation, specify Spicer . . . a mark of quality found on over 14,000 railway positive gear drives.

DANA Spicer

DANA CORPORATION

Toledo 1, Ohio

SERVING RAIL TRANSPORTATION—Transmissions Universal Joints • Propeller Shafts • Generator Drives Rail Car Drives • Pressed Steel Parts • Traction Motor Drives • Forgings • Stampings.

Many of these products are manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario

Spring-loaded belt between side sills of two units is safety feature designed to prevent men from going between the permanently coupled sections.

AT&SF Articulates Piggyback Cars

To handle longer trailers, Santa Fe has now turned to use of two permanently coupled, single-trailer units

An experimental articulated TOFC car, built by the Santa Fe and operated from Chicago to Los Angeles, Dallas and other points for the past several months, has proved sucessful. The Santa Fe's West Wichita, Kan., shop is now building 100 additional cars. Advantages claimed over the widely used 85-ft and 88-ft single-unit cars are:

- No clearance problems;
- No special brake-pipe and angle-cock locations;
- An AB valve on each unit giving standard propagation of a brake-pipe reduction;
- Easy access to car deck for loading crews.

An advantage of this arrangement over use of two separate single-trailer piggyback cars is that brake-pipe leakage is reduced with the elimination of two angle cocks and installation of a single continuous hose at center of car instead of two separate air hoses with couplings.

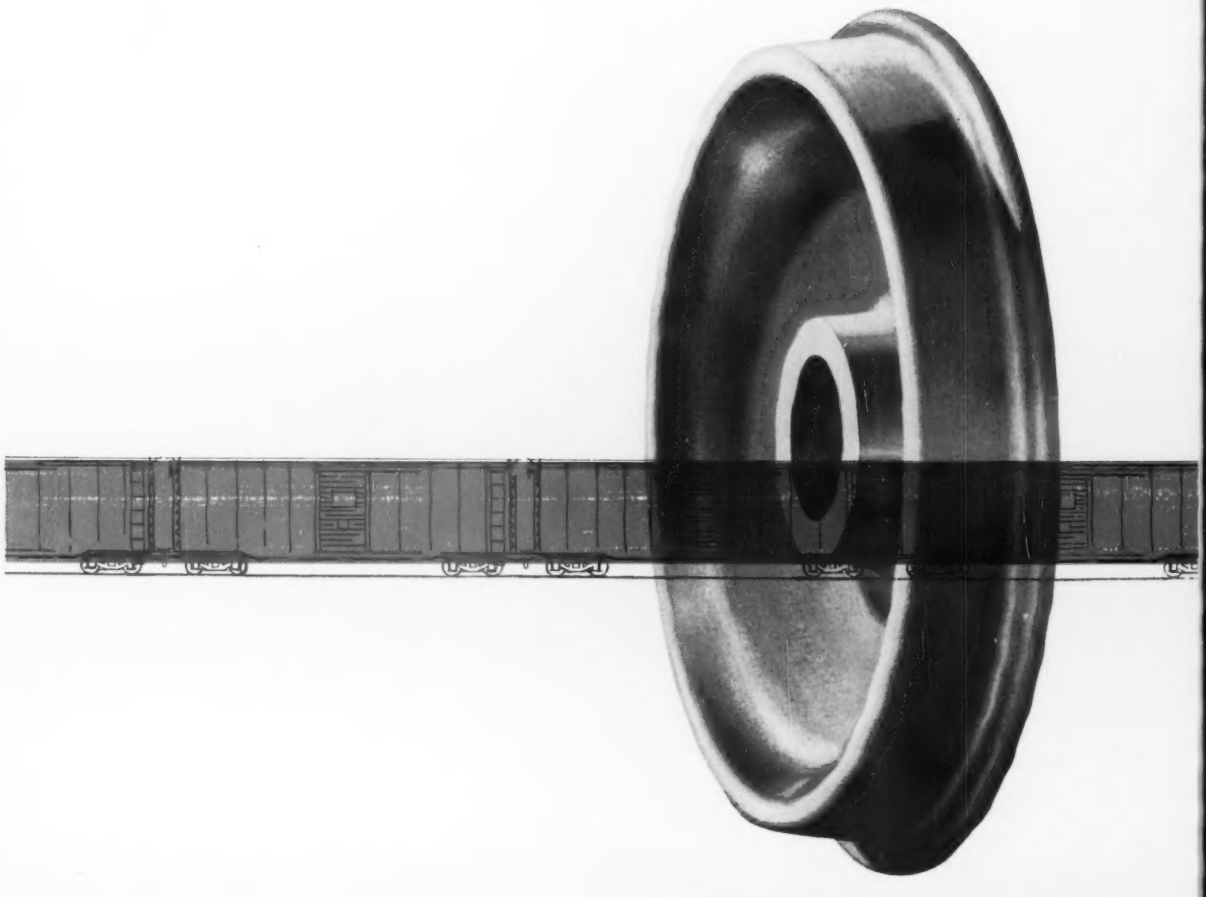
This 92-ft car consists of two 44-ft 6-in. flats joined by a permanent coupler and a flexible extension or skirt along the side sills. It is equipped with Brandon WK-1 trailer tie-downs and can handle two 40-ft refrigerated trailers.

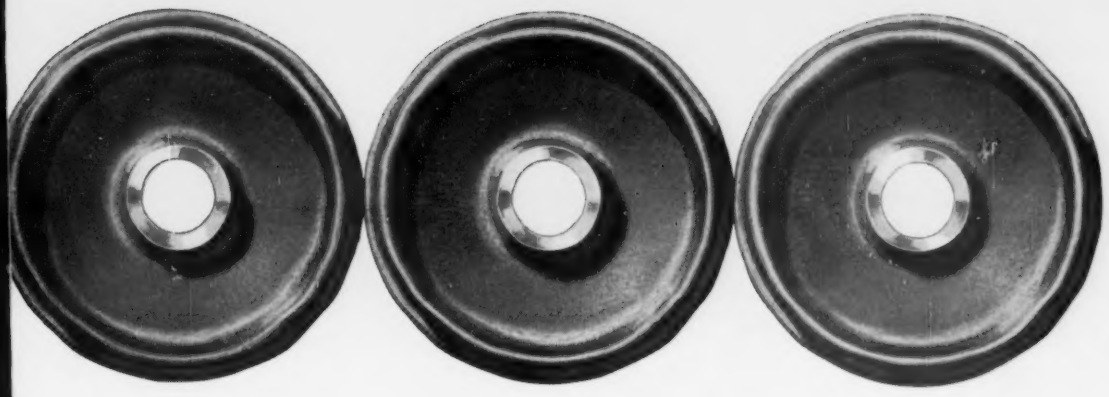
The center connection provides both lateral and vertical swivel move-

(Continued on page 39)

Bridge between two units, made of ¾-in. plate, is secured by two pins extending down pipe sleeves in deck of one unit. It is also retained by two safety chains on that unit.

EQS Wheel Is Now Rolling





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On The Nation's Tracks...

We're not interested in numbers, we're interested in *quality*...but we can't help pointing with pride to the fact that the *millionth* EQS Wheel is now rolling freight back and forth across the continent.

The millionth EQS Wheel has a proud ancestry ...hundreds of thousands of other EQS wheels that have received an overwhelming vote of confidence from America's railroads. They received this vote because of incredible strength, superb balance, and precision tolerances.

The Electric Quality Steel Wheel was specifically developed to carry back-breaking freight car loads faster and farther. The flange and rim of this wheel are the *toughest* known to modern railroading. That's why the EQS will reduce *your* wheel costs per car mile!

Griffin—the world's largest producer of freight car wheels—has eleven strategically-located plants to provide you with the ultimate in service. For the highest return on your wheel investment, *specify Griffin EQS.*

GRIFFIN EQS

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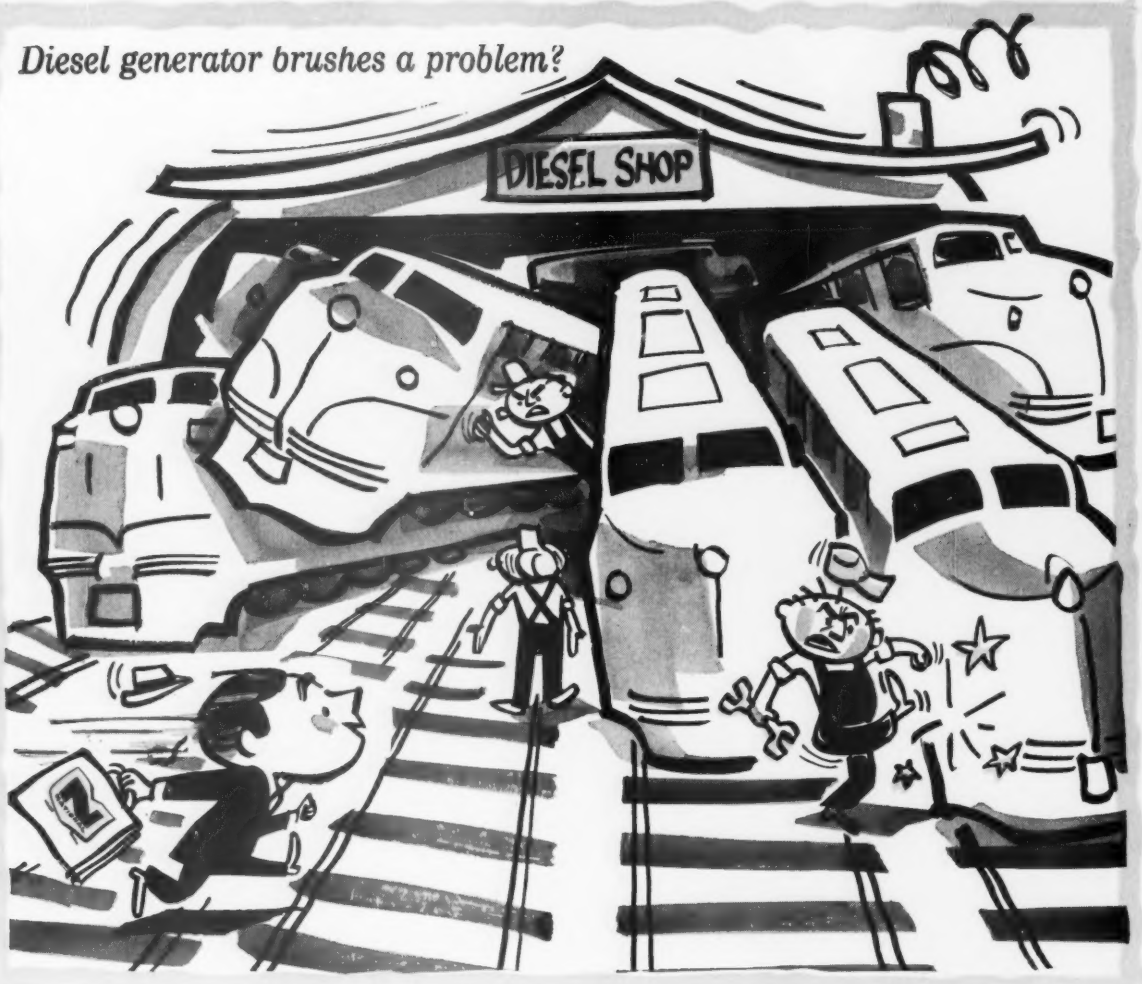

Your NATIONAL TRADE-MARK brush man helped this road stop excessive maintenance!

JOHN PEDLAR

Serious copper dragging and flashovers kept putting diesel main generators out of action on this mid-western railroad. The result, says "National" Carbon Brush Man, John Pedlar, was a critical repair and maintenance problem.

By carefully analyzing generator workload, John Pedlar, working closely with the railroad, found improper brush selection the source of trouble. Grade DE-2 "National" brushes were recommended and applied. The road now considers its generator brush operation completely satisfactory.

John Pedlar and his fellow "National" Carbon Brush Men have been solving railroad brush problems for years. Their experience and training – backed by "National" *long term brush development* – make them the logical consultants on any railroad brush problem.

Call your "National" Brush Man today. Or write National Carbon Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

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OFFICES: Birmingham, Chicago, Houston, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **CANADA:** Union Carbide Canada Limited, Toronto

Articulated car is 92 ft 5-½ in. over end sills and has deck height of 3 ft 9-5/16 in. Previously, the Santa Fe had put into service the longest single-unit piggyback cars with an overall length of 88 ft. They were built during 1958 (RL&C, Sept. 1958, page 48).

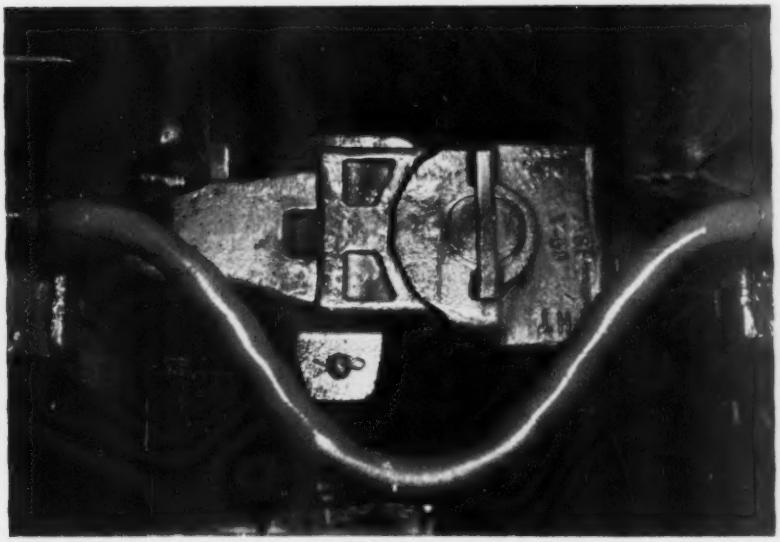
Articulated Piggyback Cars

(Continued from page 35)

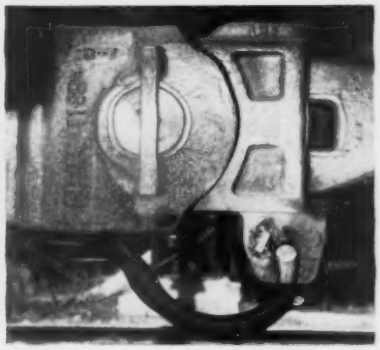
ment. The two units cannot be separated, except by use of a cutting torch or chisel to cut away the welded lock. This arrangement eliminates uncoupling levers, handholds and angle cocks at the center of the car. The end sills are extended 12 in. at the inner end of each unit to narrow the opening between them to 17½ in. A hinged apron covers the opening between the decks. The flexible skirt gives the appearance of continuous construction along the side sills. It also prevents anyone from going between the two units. Heavy leather belting forms the flexible skirt and is painted the same color as the remainder of the car. It is installed between the extensions of the side sills. Each end of the belting is equipped with a pipe-encased cable which, in turn, is fastened to a spring loaded shaft that keeps the belting taut at all times.

The coupler between the two units is an ASF Universal, three-piece model, allowing radial, vertical and horizontal movement. National MF 400 rubber draft gear and Universal hand brakes are applied. The sill steps and side grab irons at the center are retained to make it easier for employees to get on and off cars during loading operations.

Cars which will be the articled units are undergoing heavy repairs at West Wichita. ASF A-3, 5 x 9 ride control trucks with 3-11/16 in. spring travel and equipped with Rolin lubricators are used. The completed car carries one number; one capacity, 160,000 lb; one lightweight, 91,400 lb, and one load limit, 180,600 lb. The end of the car that must be spotted against the loading dock is arbitrarily designated the "A" end.



One-piece Aeroquip hose replaces original air-brake hoses and angle cocks. Crossover pipe is eliminated on one unit so hose does not cross under the permanent coupler.



Welded lug over opening in radial connection prevents the removal of the keeper pin.

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No. 767-LB 1/4" (As shown). New! Bends any angle up to 180°, accurately, easily..... $ 7.30
No. 768-LB 5/16" New!..... 8.75
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No. 772-LB 3/4" New!..... 33.50
No. 773-LB 7/8" New!..... 39.00

NEW TUBE CUTTERS

753-C shown, for ⅛" to 1⅛" O.D. tubing. Has spare cutting wheel, fold-away reamer. $4.15. Others for ⅛" thru 4" O.D. Priced $1.95 to $14.95.

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760-F shown, for fast accurate flaring 7-sizes from 3/16" to ⅝" O.D. Price $3.95 — others for ⅛" thru 1⅛" O.D. Priced $5.75 to $15.75.

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Traction Gear Wear

(Continued from page 26)

advantage can be taken of this property when gearing is completely interchanged because of the likelihood of variation in gear centers and the frequency with which the new gears will be mated with worn gears that depart from correct profile.

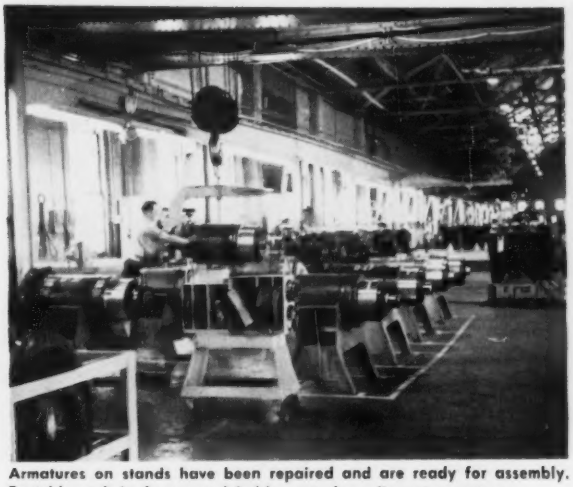
Template gages can be used simultaneously to evaluate tooth profile and to measure reduction in tooth thickness. Care should be taken to prevent tooth wear beyond the point where tooth breakage can be avoided.

The precision of a template type measurement depends to a large extent on the efficiency and experience of the inspector. Basically, consistency is more important than accuracy if properly related to the condemning limit. Consistency within 0.003-0.005 in. should be possible.

Effort must be made to hold new gearing within proper tolerances. Profile errors manufactured into gearing will reduce the life of motor and drive components substantially. Profiles on new gearing should be held within ± 0.002 in. Salvage-ground gearing with more than four times normal backlash performed well mechanically in the test program. It transmitted motor torque as smoothly as new gearing. Therefore, regrinding should be considered carefully for reclaiming condemned gearing. This process is applicable as long as tooth thickness and hardness requirements are satisfied. For two-pitch pinions of the type tested, the minimum allowable tooth-tip thickness is 1/16 in. For two-pitch gears, this limit is 1/8 in. Gear teeth for salvage grinding must have a favorable depth of hardness. In cases where they do not, a method must be developed for rehardening before regrinding, or the gearing will not be serviceable.

Patterns measured during the evaluation of tooth profiles indicated a strong tendency for the teeth to wear into and taper along the length of the tooth. This is to be expected with cantilever shafting. Improvement in life can be obtained by initially grinding a taper into one of the members.

The results of these field tests indicate that the railroad must carefully police its gear-case practices, its lubrication and binding-wire practices, and the maintenance of correct gear centers. Attention to gear centers is particularly important.



Armatures on stands have been repaired and are ready for assembly. Portable rack in foreground holds parts for adjacent armature.

Reconditioned armature is installed in an overhauled motor frame. Stands and racks for eight motor parts are provided through shop.

At Milwaukee Shop . . .

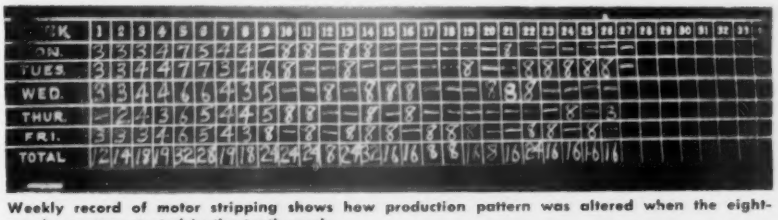
Eight Traction Motors or None At All

A day's operation of the Milwaukee's tractor-motor repair line in its Milwaukee, Wis., shop is based on the availability of eight motors for stripping or assembly, regardless of the make of locomotive or type of motor. Repairs of less than eight at a time have been eliminated, except in unusual cases where emergencies require immediate attention. Normally, if eight motors are not available, the line doesn't operate.

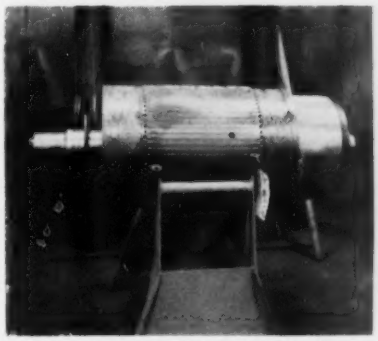
Progress of repairs to traction-motor frames and armatures is kept on a wall-mounted board. Red tags are for frames and white for armatures. When both tags show up together in the "Ready for Assembly" columns, opposite any eight motor serial numbers, the shop has a day's work.

Wall charts, kept on a five-day week basis, point up the advantages of the new system for stripping and rebuilding. In nine weeks prior to the establishment of the new procedure, 184 traction motors were stripped. This was accomplished by a machinist and helper working an assigned 40-hr week, with an extra machinist and helper assisting when needed. During the first nine weeks under the new system, 158 motors were stripped in 20 working days. On the 25 days during those nine weeks when the line did not operate, the two machinists were used on other work. In 12 weeks, the old system produced 259 rebuilt motors. Under the new, 210 motors were rebuilt in 29 working days in the first 12 weeks.

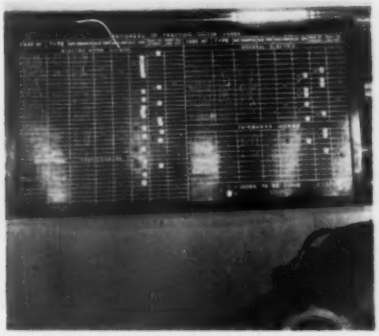
Traction motors are removed from



Weekly record of motor stripping shows how production pattern was altered when the eight-per-day system started in the tenth week.



Armatures are rotated in stand during the corn blasting to assure complete, even cleaning.



Progress of motor components through shop is recorded with colored tags on this board.

the wheel sets in the wheel shop. Each motor is placed on a specially designed stand and sent through an automatic, high-pressure hot-water wash. Each stays with its own stand, unless removed for machine work or welding. The motors then go to the stripping line where they are disassembled and the frames checked for defects. Two machinists do this work, as well as pull pinions.

Suspension-bearing surfaces, lateral surfaces of the bearings, nose supports and traction-motor lugs are brought back to standard. New wear plates are applied at the nose supports, if necessary. Cases requiring welding go to the blacksmith shop, and nose support plates are applied in the boiler shop. For electrical work, frames are first corn blasted, then go to the electrical shop for repairs. Repairs include removal and repair of field coils, interpoles, and brush holders. This department also works on groups of eight, with a force of five electricians.

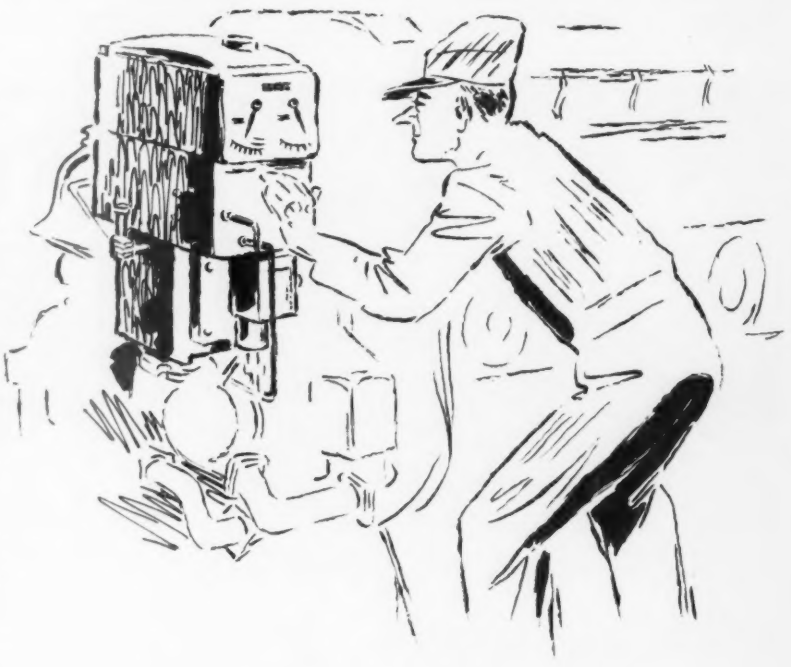
Armatures removed on the stripping line are placed on special stands, four at each end of the line. The stand, designed to be handled by a Hi-Lo truck, stays with the armature throughout the repair operations. Heads and bearing races are removed. After stripping, the armature goes to corn blast and is positioned in supporting hangers so it can be rotated during cleaning. Armatures then go to the armature room where repairs, up to complete rewinding, are done. They are then dipped, baked and sent to the assembly line in groups of eight.

Heads, bearing races, and oil flingers are trucked to the degreaser and then to the armature assembly and reconditioning area. Complete sets of renovated parts for each type armature are placed in portable racks which are then moved to the proper armature for application. Two machinists do this work.

When the armatures, cases and related parts are ready, the traction motors are assembled in groups of eight. The assembly of the armature to the case and application of pinions is done by one machinist and helper. The motors are then given a one-hour run-in and insulation test, and bearings are checked. Motors are then sent to the wheel remount bay.

Why does the Milwaukee repair eight traction motors per day? It's because their present truck shop output is four trucks per day.

From the Diesel Maintainer's Note Book



Pointed To Trouble

By Gordon Taylor

Engineer Casey and Fireman Black were operating a two-unit F3 Diesel locomotive. It started its run without trouble, but, after a time, seemed to grow lazy. The locomotive seemed to have lost some of its pep.

"One of these horses doesn't seem to be hauling its share of the load," Casey told Black. "We're starting to lose time for lack of power. Check in the engine rooms to see what you can find wrong."

When Black got back in the engine room of the lead unit, he glanced at the indicator plate on the governor. The speed indicator on the right-hand scale was standing at 8, which indicated the throttle was in No. 8 position. The fuel pointer on the left-hand scale was standing at 10, which indicated the engine was not loaded and there was probably electrical trouble. He then checked the control air pressure, thinking it might be low. He found it was OK.

Then Black noticed that the load regulator was standing in minimum field position; the regulator brush arm was at the 5 o'clock position.

There was nothing that he could think of to make the load regulator swing back toward the maximum field position. That's where any well-behaved load regulator would be to make the generator pick up its load.

Black knew that a main generator had to be properly excited, so he inspected the battery field contactor to see if it was closed. It was, and so was the generator shunt field contactor. He then remembered that the shunt field contactor has to be closed before the battery field contactor will pick up and close. The A-B interlock on the closed shunt field contactor is what completes the circuit that energizes the battery field contactor.

It was now clear that the engine had speed control. Even with the generator field circuits closed, the generator could not develop full output because the load regulator would not leave the minimum-field position. The two enginemen could think of nothing to correct their trouble. To further complicate matters, the erratic action

(Continued on page 44)

This series of articles is based on actual experiences of men who operate and maintain diesel-electric locomotives.

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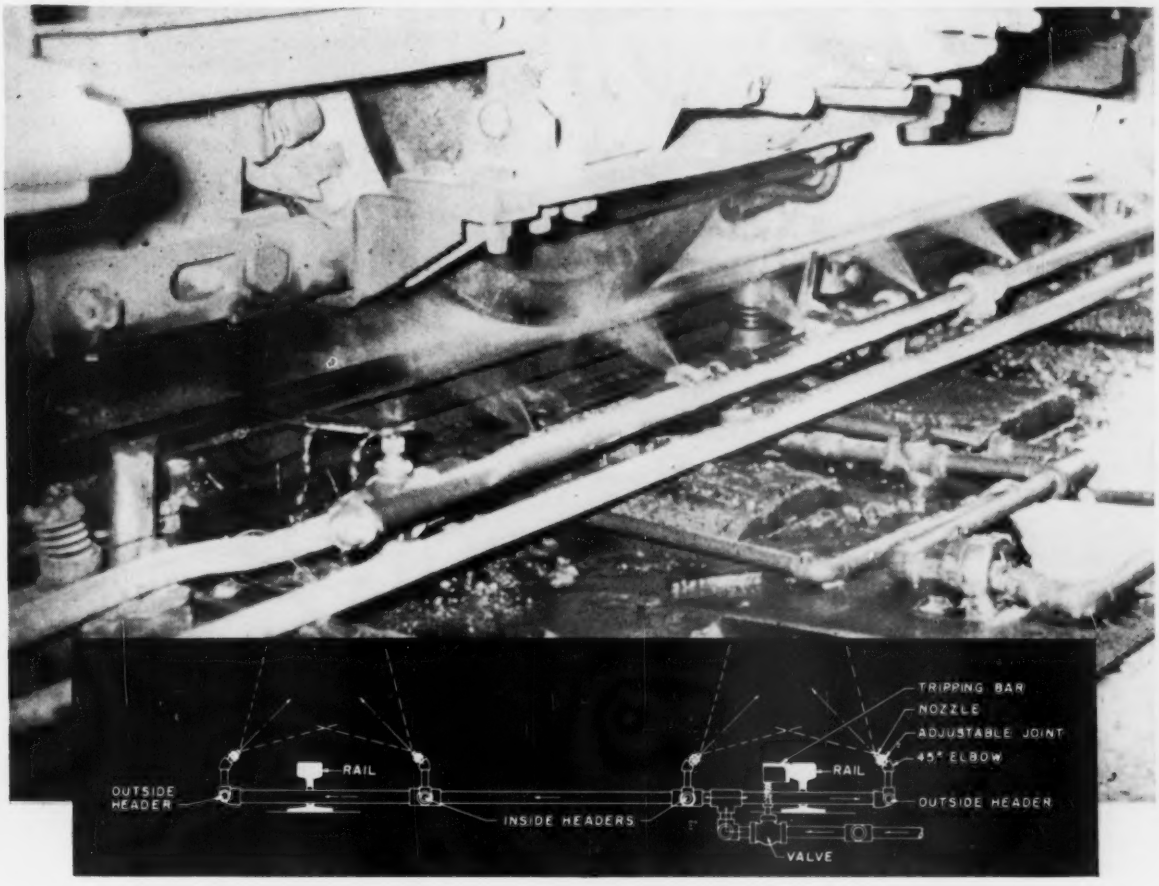

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(Continued from page 42)
would clear up for a short time and then reappear.

The trip continued, but some time was lost en route. Doc Watts, the electrical foreman, was available when the locomotive tied up. After hearing the story, he said: "It sounds like the overriding solenoid, ORS, is involved because of some trouble with the battery field contactor."

"But," said Black, "I just told you that the battery field contactor was closed when I examined it, but the load regulator was staying in minimum field position."

"That could be just as you say," said Doc, "but if the C-D interlock on the battery field contactor was in trouble, it could have caused ORS to be energized, and this would have caused the load regulator to stay in minimum field position."

"Suppose," said Black, "that you give us a little talk on this case and tell us more about the ORS; I know nothing about it and would like to understand the cause of this trouble."

"The overriding solenoid," Doc explained, "is a magnet coil built into the engine governor assembly near the engine speed control solenoids A, B and C. The ORS is energized by a normally closed interlock C-D on the battery field contactor. That interlock is closed when the locomotive is at rest with the battery field contactor de-energized. When the battery field contactor is open, the ORS is energized and causes the pilot valve that controls the load regulator to move upward ⅛ in. which causes the vane motor of the road regulator to move it toward minimum field position.

"When the battery field contactor is energized, its interlock C-D should open and de-energize the ORS. When ORS is de-energized, a spring moves the pilot valve to normal position so the load regulator can find the position needed to load the main generator and engine. I might add that during 2-to-3 and 3-to-2 transistions, the battery field contactor is de-energized. When that happens, its interlock C-D closes the control circuit to energize ORS, causing the load regulator to move toward minimum field and thus reduce the load on the engine after transition."

"Now, if you have followed my explanation, it would appear that ORS was being energized when it should not have been, and the most likely cause would be a defect in, or at, the C-D interlock of the battery field contactor. So we will now check it."

An insepection of the battery field contactor (one of the older types), revealed that the interlock contacts did not break clean and free every time. The contact tips were corroded and there were dust and contact particles that could cause current leakage paths. A thorough clean-up of the battery field contactor and proper adjustment of the interlock contacts corrected the trouble.

"Thanks for your explanation, Doc," Fireman Black said, "but does this apply only to the F3 units?"

"Well," replied Doc, "this sort of thing could happen to most any other type of EMD locomotive, including the E8 and F7 units that have the old style contactors. As a matter of fact, any diesel engine governor with an ORS depends on the opening of C-D interlock on a closed battery field contactor to de-energize the ORS coil and thus release the load regulator from its minimum field position. One thing that has happened is that locomotives built in recent years have more dependable battery field contactors.

"The builder has for some time been supplying a new style contactor that almost completely eliminates the trouble experienced with older style contactors. The new models have special alloy contact tips which should never be filed or cleaned. These tips require no maintenance until the alloy material is worn through to the base metal, at which time the contacts must be replaced. This, of course, is a problem for the maintainers. The operating crew performs its duty when it makes an accurate report of troubles encountered."

"I believe this wraps this case up," said Watts, "and I hope it clears up one or two points about the control circuit of the locomotives. Just remember that the shunt field contactor has to close before its A-B interlock will close to energize the BF contactor, and, when BF contactor is energized, its C-D interlock must open to de-energize ORS.

"When ORS is de-energized, a spring moves the pilot valve that controls load regulator back to its normal position. This permits the load regulator to move away from minimum field position so it can excite the main generator to make it and the engine get busy."

GN Mechanizes Car Cleaning

(Continued from page 19)
eight car lengths in one operation. A smaller cable, or haul-back line, ten car lengths back, returns the car-puller cable to its starting position. The car-puller cable is attached to the transom plate of the rear car when a cut of cars is to be moved. The system was designed by Link-Belt.

Gondolas are grouped on one track for cleaning and are pulled to the concrete clean-out pit, a one-spot operation. The pit is 50 ft 6 in. long, 6½ ft deep, and 10 ft 6 in. wide at the top, with the track supported on steel columns and beams. The pit tapers down to 20 in. at the bottom where a coil-mounted shaker conveyor is placed. Debris falls on this conveyor and moves to the main inclined belt conveyor for dumping and subsequent burning. As the gondolas move through the washing operation, the doors are tripped by hand, the front sections first. An overhead 2½-in. water line with a spray header is swung over the gondola, and washing is done as the cars are pulled through.

Improvements are still being made to increase the efficiency and output of the operation. Among these are:

- A water spray located at the exhaust duct from the vacuum fan to eliminate dust and dirt particles in the air.
- A 100-ft grain door belt conveyor to parallel the cleaning track and adjoin the nail flattener. This will eliminate one step in the cleaning line.
- A pressure plate to replace the roller nail flattener, pressing the nails into the grain doors instead of bending them.
- A spring loaded retarder at the south end of the concrete pit to position cars more accurately.
- A fiber-glass canopy, 50 ft long, extending 35 ft on the control side over the vacuum cleaner and conveyor. The canopy will extend over the car and working platforms and 4 ft on the opposite side. A rigid pipe, fastened to the canopy, will replace the flexible hose connection to the vacuum cleaner hopper.
- Four "trapping" machines, two on each side, will close hopper doors at the gondola clean-out pit.

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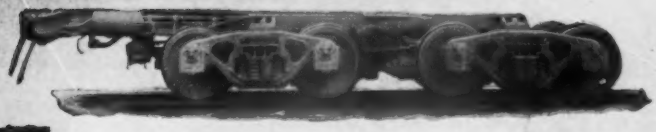

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(Continued from page 10)

mined differential is surpassed, the relay is energized to operate either a warning light or alarm so that slip can be corrected. Differential can be set in accordance with individual requirements. No maintenance schedule is needed. *Locomotive and Car Equipment Dept., General Electric Co., Dept. RLC, Erie, Pa.*

Mobile Repair Unit

A multi-drive mobile repair unit is in service in the Marshalltown, Iowa, area of the Minneapolis & St. Louis to brass cars, replace wheels in the case of burned-off journals, re-rail cars, and assist in wrecking operations. The FWD model 286 is powered by a 185-hp RD-150 engine. It carries a portable electric generator for powering floodlights and electric hydraulic jacks; acetylene cutting and welding equipment; a monorail crane with two U-shaped rear-support posts that can be pivoted outward and locked in position to give additional clearance as needed when loading and unloading mounted wheels and truck assemblies. A 45,000-lb pull Braden single-drum winch operates the monorail crane and is available for direct line-pull winchng. Brasses, wedges, blocking and hand tools can be carried in two compartments on the underside of the body.

The truck has a coupe type cab, standard 10 x 20 tires, and a reinforced platform body with a capacity of 28,000-lb gross weight. *FWD Corp., Dept. RLC, Clintonville, Wis.*

Air Hoist

Several throttle and brake systems make the JCP-120 air powered hoist adaptable for car spotting. The hoist, mounted on a skid type base for portability, has a lifting capacity ranging from 27,000 lb at 37 fpm to 3,700 lb at 220 fpm. Throttle, brake and clutch controls are mounted on the hoist in the standard model, but can be removed and operated from a remote position. The hoist can also be equipped with electric motor drive of 10 to 25 hp, or air-cooled gasoline or diesel-engine drive. *Joy Manufacturing Co., Dept. RLC, Oliver Bldg., Pittsburgh 22, Pa.*

Spray Painting System

Hydrastat, a "fog-free" spray painting system, is said to save up to 40 per cent of materials. It handles primers, enamels and most lacquers without heating and uses no atomizing air. Atomization is accomplished through the high pressure at which the paint is delivered to the spray tip. The specially designed tip explodes the fluid stream into finely atomized paint particles which provide a uniform deposit of any thickness, without bounce-back or overspray.

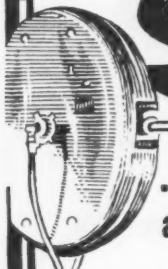
The system can be used indoors or out; only a minimum of air movement is required to dispel solvent fumes. The portable 7827A unit is mounted on a three-wheel dolly and accommodates either 5- or 10- gal containers. It has a power hoist for drum changes. A built-in agitator keeps the paint ready to spray at all times, and two or more spray guns can be easily served with continuous flow of paint at constant pressure. The 7827J is a similar unit, without cart and power hoist.

The 7887A unit sprays directly from original 54-gal drums. It, too, has built-in agitator, power hoist, and constant pressure delivery through two or more spray guns.

Spray tips are available in a variety of fan angles and spray patterns. *Alemite Div., Stewart-Warner Corp., Dept. RLC, 1826 Diversey Parkway, Chicago 14.*

Lubricant for Diesel Locomotives

Shell Talona RS Oil 40 is a diesel lubricating oil for locomotive engines. It is said to have improved anti-wear qualities and to resist deterioration. It has been extensively tested in heavy duty freight service for the past three years. According to the company, roads using it report that some engines have run in excess of 200,000 miles, giving no indication of requiring an oil change. Conventional oils generally are changed at 30,000 to 50,000 miles. Regular oil filters can be used to keep the oil clean. *Shell Oil Co., Dept RLC, 50 West 50th st., New York 20.*



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Scotchtrap brand dry thread sealer No. 4212 is a chemically inert plastic tape designed to seal and to permanently lubricate threaded and coupled pipe joints. It conforms to all types of pipe threads and fittings in any pipe system, low pressure or high, up to thousands of psi. The tape is made with a Teflon TFE-fluorocarbon resin; can withstand processing temperatures from the liquid-oxygen range through that of superheated steam, and is not affected by oil traces or other lubricants in the steam line. The tape eliminates the need for brushing dope solutions on pipe fittings and can be applied by one person. It is white and pliable and is available in 260- or 520-in. rolls, ½ in. wide. *Irvington Div., Minnesota Mining & Manufacturing Co., Dept. RLC, 900 Bush ave., St. Paul 6, Minn.*

Heliweld Automatic Units

Models HMH-D and HMH-E Heliweld automatic units are electronically controlled and can be used either for a.c. or d.c. Heliwelding, without an accessory control, using argon, helium or mixtures of these shielding gases. The units are designed for long-run production Heliwelding applications on all ferrous and non-ferrous metals where stringent specifications must be met.

The units are identical with one exception; the Model HMH-D is equipped with 3-in. and 12-in. offset bars to which the machine holder can be attached. The machines rotate 360 deg in any position with a 2-in. adjustment of the machine holder across the weld bead, and have a vertical travel of 14½ in. They can be operated at a maximum of 500 amp continuous duty cycle, d.c. straight polarity using thoriated tungsten electrodes or 350 amp a.c. Electrode diameters from .010 in. through 3.16 in. may be used. Holders have a maximum vertical rate of rise of 24 in. per minute. *Air Reduction Sales Co., a division of Air Reduction Co., Dept. RLC, 150 East 42nd st., New York 17.*

Journal Lubricator

The manufacturer of the Oilrite twin-pocket journal lubricator (RL&C, December 1959, p 10) is now the *Railway Car Equipment Co., 1400 E. Tremont st., Hillsboro, Ill.*

Report

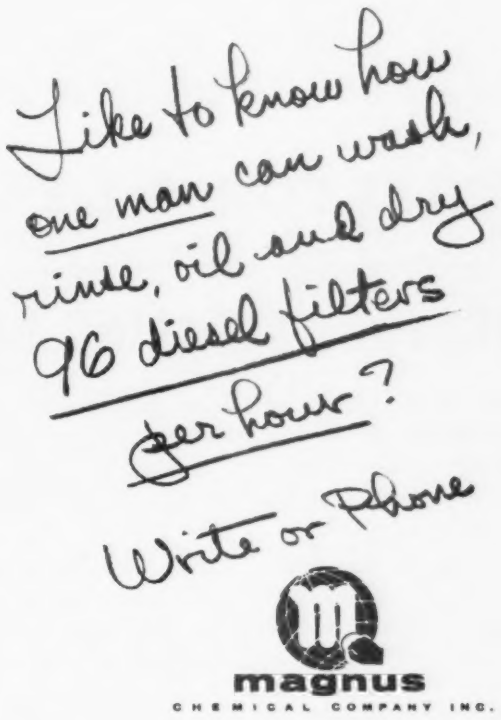
(*Continued from page 7*)

Cartridge Bearing Lub Period Extended

Mandatory 30-day lubrication period for cartridge bearings, established by the AAR Mechanical Division November 12 for inclusion in the 1960 Code, has been changed to 90 days. Revised new rule 66-B will cover. (RL&C, December 1958, p 8).

Freight-Car Roller-Bearing Orders

Freight car roller bearing orders have been booming. Timpkin had received orders in 11



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wanted for railway robberies involving diesel-electric locomotives. Nationwide record of previous arrests often resulting in suspect being run out of town on a rail. Known to be physically infirm, subject to fractures and broken shunts. When heat is on, suspect hides out behind innocent commutators.

When corralled, place suspect in cooler and immediately notify Stackpole Carbon Company, St. Marys, Pa. Upon trial and conviction, Stackpole will remit recommendations for new brush grades that give longest life consistent with profitable operation and optimum commutation.

STACKPOLE *diesel-electric* **BRUSHES**

keep railroads rolling p-r-o-f-i-t-a-b-l-y

electrical contacts • seal rings • welding & brazing tips • electrochemical anodes
graphite bearings • voltage regulator discs • electrical & electronic components
rocket nozzles

months of 1959 for 30,074 car sets for application to main-line freight cars. Total includes 2,812 car sets ordered by builders for cars not then assigned to railroads. This was 67.5 per cent of the 45,965 freight cars reported equipped with all makes of roller bearings at the end of 1958.

Crewless Road Switcher Undergoing Tests

A western railroad and two railway suppliers are running tests on the West Coast of a crewless road switcher placed in the middle of a train. It is controlled electrically and with radio from the lead engine. Preliminary tests confirmed feasibility of operation. The crewless engine can be any place in the train.

Personal Mention

Canadian National.—*Moncton, N.B.:* KENNETH W. THOMSON appointed superintendent shops, succeeding WINSBY WALKER, retired. Mr. Thomson formerly superintendent locomotive shops, Transcona, Man.

Elgin, Joliet & Eastern.—*Joliet, Ill.:* ROBERT A. ROBOWSKI appointed general foreman, car shop. *South Chicago, Ind.:* HOWARD C. CARTER appointed general car foreman, succeeding Mr. Robowski. *Gary, Ind.:* EDWARD C. HEDLUND, industrial engineer, appointed general car foreman, succeeding Mr. Carter.

Louisville & Nashville.—*South Louisville, Ky.:* JOHN J. SCHELL appointed departmental foreman, wheel and axle shop, succeeding W. W. GROVES, deceased.

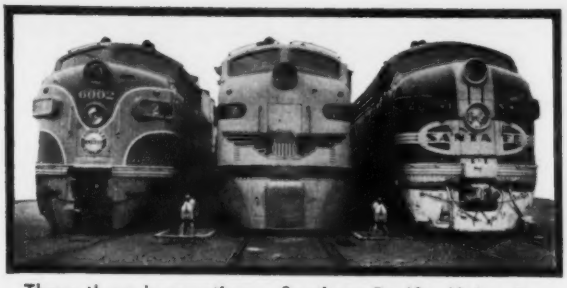
New York Central.—*Chicago:* RUSSELL L. HAUTH appointed assistant master mechanic. Formerly district car inspector at Cleveland.

Southern.—*Atlanta, Ga.:* A. M. CARY appointed superintendent motive power. *Huntingburg, Ind.:* CLIFFORD A. JAY, JR., appointed master mechanic. Formerly general foreman car repairs at Birmingham, Ala. *Asheville, N.C.:* CLARENCE E. QUINN, foreman car inspector, appointed general foreman. *Greenville, S.C.:* ROBERT G. ROMANSTINE, JR., appointed road foreman of engines. *Knoxville, Tenn.:* MITCHELL I. SMITH appointed superintendent wheel shop at Coster shop.

Southern Pacific Lines.—*Houston, Tex.:* A. I. SELLERS appointed acting superintendent mechanical department.

OBITUARY

Cecil D. Schwine, Jr., superintendent motive power of the Southern at Atlanta, Ga., died November 7.



These three locomotives—Southern Pacific, Union Pacific and Santa Fe—are equipped with safe, sure, dependable Air-Push Windshield Wiping Equipment, as are 95% of all modern diesel locomotives. Designed for heavy duty, all-weather service with minimum maintenance.

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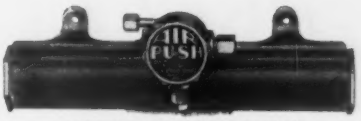

SAFETY STARTS WITH SEEING!

Sprague DEVICES, INC.
MICHIGAN CITY, INDIANA

Supply Trade Notes

ACF INDUSTRIES, INC. — *Russell C. Taylor* elected president, succeeding *James F. Clark*, now chairman of executive committee. Mr. Taylor previously vice-president, executive department, American Can Co.

■

NALCO CHEMICAL CO. — *Thomas C. Jones* named president, succeeding *Joseph A. Holmes*, now vice-chairman, board of directors. Mr. Jones formerly manager, Chicago district, Aluminum Co. of America.

■

OAKITE PRODUCTS, INC.—*Warren W. Homeyer*, sales engineer, appointed to St. Louis, Mo., technical service staff.

■

GOULD-NATIONAL BATTERIES OF CANADA, LTD.—General sales office now located at 1819 Yonge st., Toronto, Ont.

■

MINNESOTA MINING & MANUFACTURING CO.—*R. L. Ackerberg* appointed division general sales and marketing manager, coated abrasives and related products division. *F. M. Metcalfe*, regional sales manager at New York, appointed division sales manager at St. Paul, Minn. *C. L. Murphy*, industrial trades sales manager, appointed division marketing manager, and *W. E. Marsden*, Eastern region sales manager for the division.

■

UNITED SHOE MACHINERY CORP.—*Kenneth E. Noyes* appointed sales representative, POP Rivet Division, New England area.

■

JOHNS-MANVILLE FIBER GLASS INC.—*Francis H. May, Jr.*, vice-president, named president, succeeding *Randolph H. Barnard*, resigned. Mr. Barnard will continue to advise as a consultant on fiber glass.

■

AJAX CONSOLIDATED DIVISION of SOUTHERN ELECTRIC, INC.—*A. W. Faulconbridge*, executive vice-president, assuming duties in connection with sales and engineering, following resignation of N. H. Arnold, president.

T. C. Jones
Nalco

R. C. Taylor
ACF

OWENS-CORNING FIBERGLAS CO.—*Ellcon-National, Inc.*, 30 Church st., New York, named sales agent for full line of Owens-Corning Fiberglas railroad products for eastern United States.

■

CORNELL-DUBILIER ELECTRIC CORP.—*Joseph Ferrante* appointed director of research in dielectrics at new Research Laboratory in Norwood, Mass. *Raymond T. Leary* appointed general sales manager.

■

SERVO CORP. OF AMERICA. — *W. P. Morrison* appointed general manager, Railroad Products Division. *Richard W. Geaney* appointed sales manager of division, succeeding Mr. Morrison.

■

MOTOR COILS MANUFACTURING CO.—*Walter F. Fauerbach* appointed vice-president sales. Mr. Fauerbach formerly manager, traction sales, Morganite, Inc.

Motor Coils has acquired a second plant at 32nd st., Pittsburgh, Pa., for the redesigning, re-engineering, and rebuilding of electric motors, generators, and transformers weighing up to 20 tons.

■

UNITED SPECIALTIES INC.—*James A. Gibbons* appointed regional sales manager for territory from Chicago south to Indiana and Ohio state lines and east to New England and Atlantic states, with headquarters at 2735 Elizabeth Drive, Avon, Ohio. Manufacturers agents appointed as follows: *Riley Enterprises*, Mobile, Ala.—northwest Florida, South Alabama, and southwest Mississippi; *James Engineering & Machinery Co.*, Dearborn, Mich.—southeast Michigan; *A. G. Craske*, Chicago—greater Chicago area and Lake County, Ind.

■

ALCO PRODUCTS, INC. — *Ferris P. Beardsley* appointed marketing manager, spring and forge division, succeeding *R. H. Binkerd*, resigned.

■

TRAVELIFT & ENGINEERING, INC.—*Pullman-Standard*, a division of Pullman, Inc., appointed Travelift sales and service representative for transportation field.

■

YOUNGSTOWN STEEL CAR CORP.—*Ceasar Baldassari*, 420 Market st., San Francisco, Cal., appointed west coast representative. *Robert E. James*, former assistant superintendent car department, Nickel Plate, assuming duties of a sales engineer, railroad specialties, at Cleveland.

■

DAYTON INDUSTRIAL PRODUCTS CO., DIVISION OF DAYTON RUBBER CO.—*Jerry R. Ludwig*, 204 Valerie Court, Glenview, Ill., appointed district sales manager, handling sales of specialized V-belts and belting for railroad equipment in the Chicago area.

■

GRIFFIN WHEEL CO.; U. S. STEEL CORP. — An agreement has been signed between Griffin and U. S. Steel that will enable the latter to explore the adaptation of Griffin's patented process for controlled pressure pouring to the manufacture of semi-finished steel mill products. Process developed by Griffin for the manufacture of steel freight-car wheels.

■

COLORADO FUEL & IRON CORP. — *Kingdon B. Dietz*, assistant sales manager, appointed sales manager, New York district.

OBITUARY

R. H. CANTZLER, representative in Cleveland office of Westinghouse Air Brake Co., Air Brake Division, died November 23.

JOHN B. TINNON, retired vice-president in charge of sales, Metal & Thermit Corp., died November 30 at New Rochelle, N. Y. Mr. Tinnon was 74.

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Now—make each car a traveling billboard with colorful decorations that advertise your Corporate image and services wherever it goes.

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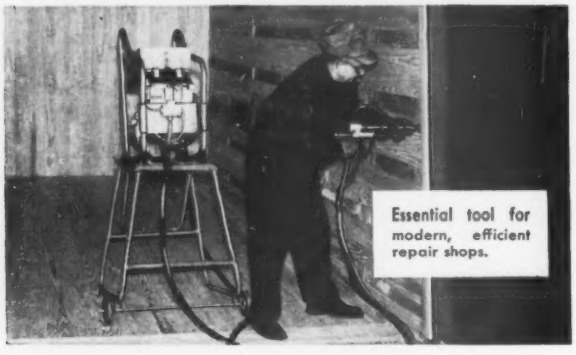

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One man can reline a box car in 2½ man-hours with a Powasert Automatic Nailer. The same job with hand nailing takes 8 man-hours.

Powasert Nailers cut worker fatigue — reduce back-breaking labor which builds up costs. You can free one or two men who ordinarily do just nailing for other work.

Powasert Nailers will drive up to 50 8-penny nails a minute. Nails are dumped into the feeder-separator unit and fed automatically to the gun. Gun works by merely pressing nose against work and squeezing trigger.

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Powasert Automatic Nailers start at $1195 with feeder-separator. Operates best from 95-120 PSI clean, dry air.

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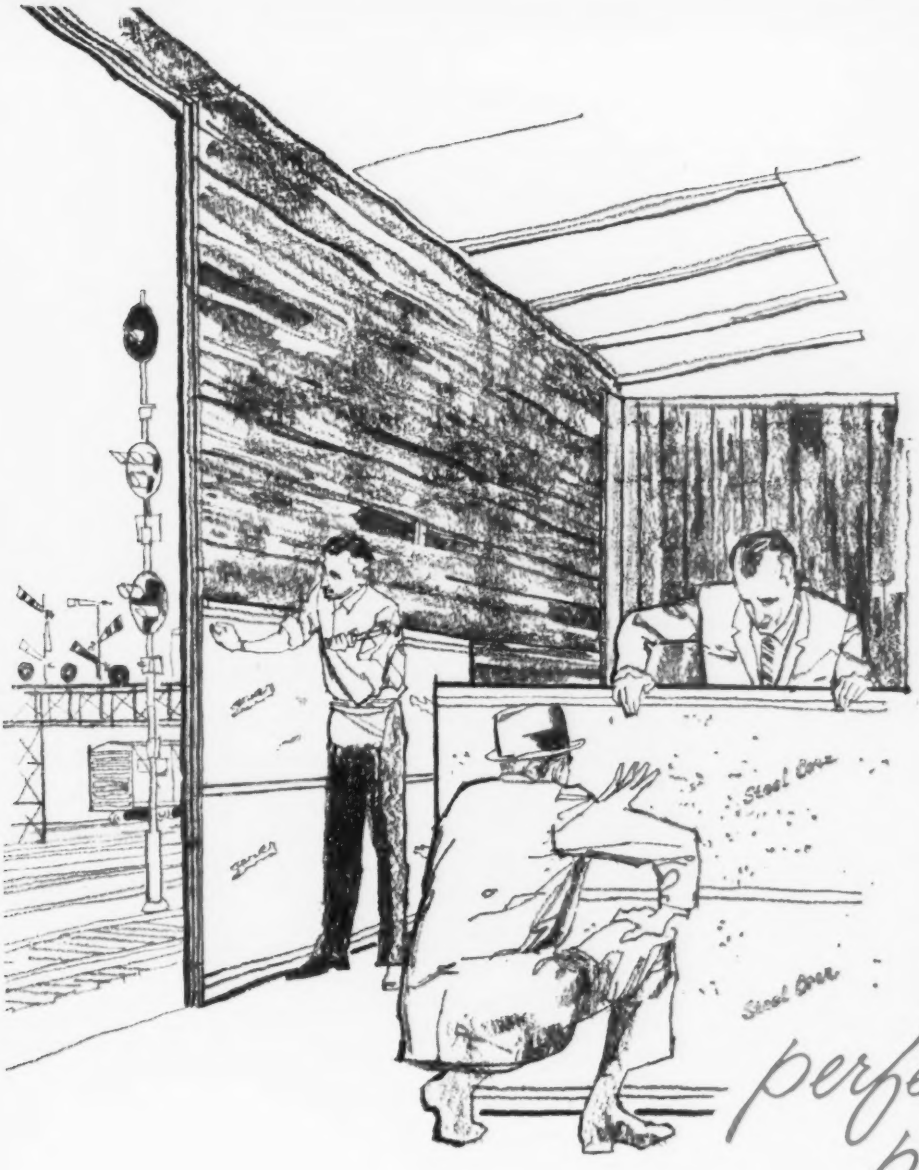

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- Better oil control . . .
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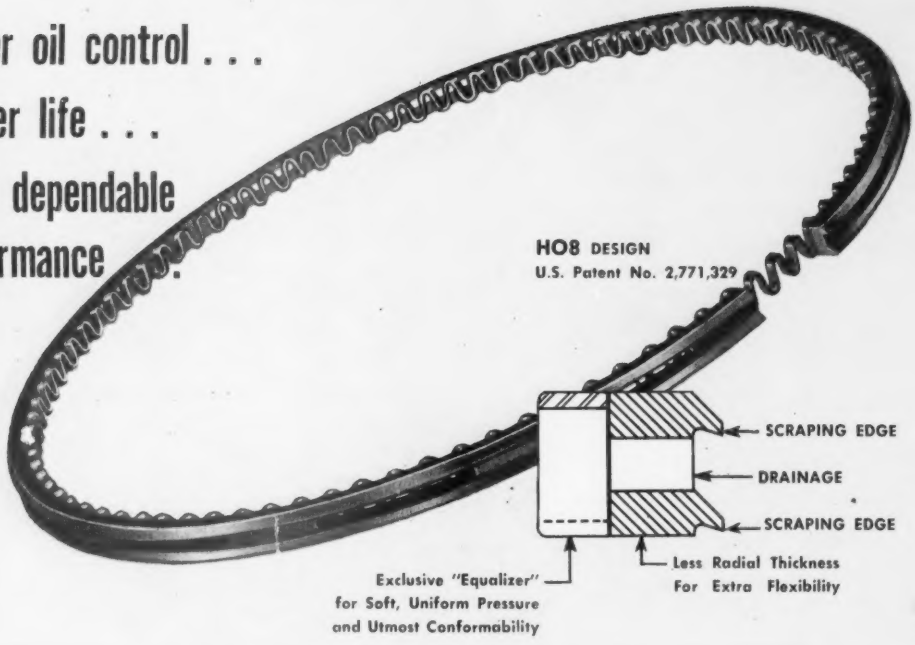

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With Pedrick's HO8 Formflex oil ring, you get far better oil control for three important reasons:

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The result is a more perfect cylinder seal and quicker, more effective drainage. You get minimum wear, lower oil consumption, longer life, less time lost due to overhauls.

Easy to install and moderate in cost, Pedrick's Formflex Heavy-Duty HO8 is just one of a family of top-flight ring designs from Pedrick . . . engineered and manufactured to provide the utmost in dependability and performance. If you wish, our engineers will be glad to consult with you. Or write for our free ring catalog. WILKENING MANUFACTURING Co., Philadelphia 42 and Toronto 2.

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